



United States Department of the Interior
NATIONAL PARK SERVICE
CORONADO NATIONAL MEMORIAL
4101 E. Montezuma Canyon Road
Hereford, Arizona 85615



IN REPLY REFER TO :

L7615

March 26, 2004

Dear Friends of Coronado National Memorial:

The enclosed Final General Management Plan/Environmental Impact Statement for Coronado National Memorial represents the culmination of four years of planning for the future of the park. We officially began the process on February 22, 2000 with a notice in the *Federal Register* announcing the intent to produce a general management plan and accompanying environmental impact statement. A news release went out to local and regional outlets shortly thereafter. Public scoping meetings began in April of that year to gather public perspectives and expectations for the national memorial as well as to collect ideas for future management, development, and interpretation.

A draft plan was written and placed on 60-day public review in August 2003. A public meeting was held in Sierra Vista to discuss the plan during the review period. Comments were received from individuals, government agencies, and organized interest groups. Many of these comments are reflected in this final plan.

Although technically not on review, this plan cannot be finalized for the next 30 days. This is so the public, organizations, and government agencies may look at the document and notify the National Park Service of any legal insufficiencies. Following that 30-day period, the Intermountain Regional Director of the National Park Service will sign a Record of Decision, which marks the end of the general management planning process.

We are very pleased to have this plan completed. It will provide the framework for management and development at Coronado National Memorial in the coming years. Thank you for your participation in the planning process.

Sincerely,

Dale Thompson
Superintendent



Coronado National Memorial

Arizona

Final General Management Plan / Environmental Impact Statement



General Management Plan / Environmental Impact Statement CORONADO NATIONAL MEMORIAL

Cochise County, Arizona

January 2004

This *General Management Plan / Environmental Impact Statement* describes five alternatives for the future management of Coronado National Memorial. The approved plan will establish a direction for guiding the memorial for the next 15 to 20 years. Some issues to be addressed are relations with Mexico, helping visitors understand the memorial's context within the region and the significance of the Coronado Expedition, livestock grazing in the memorial, preserving cultural landscapes, and ensuring efficiency and sustainability in developments.

Alternative A, the no- action alternative would continue the current management. It forms a basis for comparing and evaluating the other alternatives. Visitor and staff facilities would be little changed under this alternative. The memorial would work with Mexico to develop interpretive programs. Livestock grazing would continue in the memorial's two leased grazing allotments following the guidance in the memorial's "Livestock Management Plan." In **alternatives B and C**, grazing in the memorial would be ended. In **alternative B, the preferred alternative**, the visitor center would be rehabilitated, with an annex added for more office space and storage. New trails would be developed, and pullouts and waysides would be added to roads. Programs would help visitors understand the Coronado Expedition and its impact on the American Southwest. In **alternative C**, the focus would be on conserving cultural and natural resources. The visitor center's interior would be remodeled to make more space for interpretation. In **alternative D**, the memorial's international aspects would be emphasized. A structure would be built to commemorate the Coronado Expedition, and an educational center would be developed in the Montezuma Ranch area. The visitor center would be expanded and rehabilitated. Grazing would continue in the Joe's Spring allotment but not in the Montezuma allotment. The visitor experience would be enhanced in **alternative E** by a new visitor/educational center, to which visitors could drive on a paved two- lane road and enjoy a panoramic view of the San Pedro River Valley and the United States-Mexico border. The visitor center would be converted into administrative offices. Grazing would be eliminated from the Joe's Spring allotment.

The potential environmental consequences of each alternative are described in this document. In **alternative A**, continued use of roads and trails would degrade soils, vegetation, and water quality. Continued crowding at the visitor center would continue to adversely affect interpretation and orientation. Livestock would continue to trample soils and consume vegetation even though this is being reduced by the memorial's "Livestock Management Plan." Continuing grazing in one allotment in **alternatives D and E** would cause similar effects, but the area grazed in those alternatives would be reduced by 14% and 25%, respectively. In **alternative B**, building the visitor center annex, parking areas, trails, pullouts, and waysides, would disturb soils and vegetation and agitate small mammals, amphibians, and reptiles. The annex would decrease congestion and allow better displays for interpretation, furthering visitor understanding. In **alternatives B and C**, ending grazing would stop conflicts between visitors and livestock, reduce soil erosion and compaction, prevent livestock damage of archeological resources, and improve bird nesting habitat and riparian habitat. Developments in **alternative C** would disturb soils and vegetation. Restoring views to those that existed at the time of the Coronado Expedition would benefit cultural landscapes. In alternatives **C and D**, access to the grasslands would be improved by closing one grazing allotment. In **alternative D**, expanding the visitor center would cause runoff and erosion, harming soils and vegetation. This would be temporary and controlled. Widening and paving East Forest Lane would remove riparian vegetation in a small area. Adapting the Montezuma Ranch structures to use as the educational center would adversely affect soils, vegetation, sensitive species, and water quality. The commemorative feature would enhance visitors' understanding of the memorial. In **alternatives D and E**, more roads, trails, and facilities could harm cultural landscapes. Ending grazing in one allotment would adversely affect individual ranchers, but the effect on the local economy would be negligible. Building a visitor center under **alternative E** would harm soils, vegetation, and wildlife habitat in a mostly previously undisturbed area. Runoff from added parking and the widened, paved Windmill Road would adversely affect soils, vegetation, sensitive species, and water quality. The new visitor center would reduce congestion, enriching interpretation, and the panoramic view from there would improve visitors' understanding of Coronado National Memorial.

This document will be on review for 30 days following the publication of the notice of availability in the *Federal Register*. Following a 30- day no- action period, the Intermountain Regional Director of the National Park Service will sign a Record of Decision, which marks the end of the general management planning process. For questions or comments, write to Superintendent, Coronado National Memorial, 4101 East Montezuma Canyon Road, Hereford, AZ 85615, or telephone 520-366- 5515.

SUMMARY

The purpose of this *General Management Plan / Environmental Impact Statement* is to define a direction for the management of Coronado National Memorial for the next 10 to 15 years. The approved plan will provide a framework for making decisions about the future direction for the management and use of Coronado National Memorial. It will establish a management philosophy and framework for decision making and problem solving so that future opportunities and problems can be addressed effectively. The plan will prescribe the resource conditions and visitor experiences to be achieved over time according to law, policy, regulations, and public expectations within the context of the memorial's purpose, significance, and mission.

The memorial was established as a unit of the national park system to commemorate and interpret Francisco Vásquez de Coronado's 16th-century expedition into what is now the United States. The memorial's southern boundary is on the border between the United States and Mexico. It offers extraordinary views of the San Pedro River Valley, and the National Park Service has an opportunity to interpret for visitors the first major exploration by Europeans into the American Southwest.

ISSUES TO BE ADDRESSED

A plan is needed to address issues related to international significance, cultural landscapes, interpretation, orientation, facility development, and livestock management.

- Illegal immigration through the memorial and illegal trafficking in drugs adversely affect resources and the visitor experience.
- The memorial's cultural landscape is gradually being eroded by modern intrusions.

- The visitor center / headquarters building, the maintenance facilities, and staff housing are inadequate, and NPS managers must decide what facilities are necessary for future visitor experiences and resource protection.
- Two areas in the memorial now leased for livestock grazing may contribute to conflicts between ranching and recreational uses.
- Public involvement is needed to maximize services for visitors and to offset the effect of overextended NPS funding and staff. Public and private groups must be encouraged to help in the memorial's mission.

ALTERNATIVES

To achieve the desired conditions in Coronado National Memorial, the planning team developed a "no-action" alternative (continuing present management) and four "action" alternatives for managing the memorial's resources and uses. After the action alternatives were formed, the team created management prescriptions (zones) that would apply — although differently — to each action alternative. Four management prescriptions were established: conservation, education, visitor services, and operations / special use. Each prescription area could have a particular combination of resource conditions, visitor understanding, facilities, and activities. Each alternative would involve different configurations of these prescriptions. The management prescriptions for each alternative are clarified in table 1 (p. 37); the alternatives are compared in table 8 (p. 77).

Alternative A: Existing Management Direction (No Action)

Alternative A, the no-action alternative, represents the existing conditions at the national memorial. This alternative is presented as a way of comparing current conditions to possible future conditions, as proposed by the four “action” alternatives. Under alternative A the current management direction would continue with no significant change in interpretation or management, and the staff would continue to work in overcrowded conditions with limited storage space. Interpretive themes would be equally emphasized. The memorial would work with Mexico to develop interpretive programs.

Cultural and natural resources would be managed, protected, and maintained as staff time and funding allowed, and inventories and monitoring would be expanded if possible. There would be no management prescriptions in alternative A.

In alternative A, as in all the alternatives, the recently acquired Montezuma Ranch, which is in the grasslands south of the main memorial road, would be evaluated for eligibility for listing on the National Register of Historic Places. In alternatives A, B, C, and E, the memorial staff then would work toward removing the early 20th century ranch structures to improve the views. If any structures were found eligible for the national register, the staff would consult with the Arizona state historic preservation office to determine what features could be removed, or documented and then removed. The goal would be to remove as many of these nonhistoric features as possible. The natural contours of the area would then be restored, and the area would be revegetated with native plant species.

The Joe’s Spring and Montezuma grazing allotments would continue to be managed according to the *Livestock Management Plan* (NPS 2000b). This would include the eventual retirement of one or both allotments if the permittees were willing. The memorial would

continue existing partnering agreements for the provision of law enforcement, communications, and fire protection, as well as working with schools and other organizations to interpret the area’s cultural heritage and ecosystems.

Alternative B: Enhance Opportunities While Protecting Resources (Preferred Alternative)

The concept of alternative B, the alternative preferred by the National Park Service, would be to enhance educational and recreational opportunities while protecting, perpetuating, and ensuring public understanding of the national memorial’s resources. Educational and interpretive goals would be emphasized, and the staff would seek new ways to foster public appreciation of the memorial’s resources.

All lands not included in other prescriptions would be in the **conservation prescription**. Grazing in the national memorial would be discontinued, and the abandoned powerline along the road to Montezuma Pass would be removed and revegetated with native plant species. All existing trails would be retained, and four new trails would be developed (locations described below for the education prescription). Some trails would be in the former grazing allotments.

The **education prescription**, in which interpretation would be intensive, would be applied to the trail from Montezuma Pass to Coronado Peak, the trail to Coronado Cave, and the grasslands north and south of the main road. The Montezuma Ranch, which is in the grasslands, would be managed as described in the discussion of alternative A. A loop trail would be developed in the grasslands south of the main road. A trail accessible for people with disabilities would be developed in the grasslands north of the entrance, using part of Windmill Road.

The **visitor services prescription** would contain the area around the visitor center,

parking atop Montezuma Pass, and the main road. Another trail would be added between the visitor center and the entrance. The rehabilitated visitor center would offer updated interpretation. Interpretation also would be available at Montezuma Pass. More pullouts and waysides would be developed along the main road. An annex behind the visitor center would contain additional office space and storage, along with a multipurpose room. To add the annex, the interpretive trail outside the visitor center would have to be removed, but a new interpretive trail accessible for people with disabilities would be developed near the current picnic area. Staff and visitors could park in the current picnic area.

A new group picnic area would be placed near the site of the old fiesta area. The visitor shelter at Montezuma Pass would be converted into a minimal contact station (staffed at peak times); at some later time it might become a sheltered shuttle stop. The interpretive media at this site would be updated.

The **operations / special use prescription** would contain the current staff housing, the maintenance area, private inholdings, and a utility corridor. A new four- unit structure might be added to house temporary employees and others at the memorial temporarily. All development would be screened from the road by vegetation.

To encourage better public understanding of its mission, the national memorial would work toward creating an offsite cultural festival to celebrate various associated cultures, emphasizing the historical aspects of the Coronado Expedition. To help visitors understand the memorial's story, the staff would promote special events inside and outside the memorial, such as programs highlighting the Coronado Expedition, its legacy, and its impact on the present American Southwest. The memorial would support the preservation of the regional ecosystem, possibly working

with partners to preserve the views of the San Pedro Valley from Montezuma Pass.

Alternative C: Focus on Resource Protection While Fulfilling the Memorial's Mission

The concept of alternative C would be to focus on conserving the memorial's cultural and natural resources for future generations. Intrusive features on the landscape would be minimized, interpretation would be updated, and the outreach program would be assertive.

All lands in the memorial not included in other prescriptions would be placed in the **conservation prescription**. The abandoned powerline along the Montezuma Pass road would be removed and revegetated with native species. Studies would be done to determine the feasibility of reintroducing native plants and animals in the memorial that were present at the time of the Coronado Expedition. Grazing would be eliminated from the national memorial. The Montezuma Ranch would be managed as described in the discussion of alternative A, page vi. Abandoned roads would be restored to natural contours and revegetated.

The **education prescription** would include the trail from Montezuma Pass to Coronado Peak and the trail to Coronado Cave. More intensive interpretation would be offered in both areas.

The **visitor services prescription** in alternative C would encompass the area around the visitor center, the picnic area, parking atop Montezuma Pass, and the main road. The interior of the visitor center would be remodeled to make more space for interpretation. The building would be evaluated for its eligibility for national register listing, and any work would be planned to protect the contributing features. The interpretive trail near the visitor center would be made accessible for people with disabilities.

SUMMARY

Some staff positions would be relocated in adequate space outside, but near, the memorial to make room for visitors to park at the visitor center. The picnic area and its access road would be retained, with parking added nearby for four buses or recreational vehicles. The dirt storage area on the road to Montezuma Pass would be removed, and that area, along with the former fiesta grounds and social trails, would be restored to natural contours and revegetated.

The **operations / special use prescription** in alternative C would comprise the staff housing, the maintenance area, private inholdings, and a utility corridor. A new four-unit structure might be built to house temporary employees and others at the memorial temporarily. Vegetation would screen all development from the road.

Strong emphasis would be placed on reaching beyond the memorial's boundaries to improve public understanding of the national memorial. The staff would join forces with various groups to tell the memorial's story. Interpretive programs would be developed with Mexican groups, and activities could support Mexican and American natural and cultural resources. The memorial would support the preservation of the regional ecosystem, possibly working with partners to preserve the views of the San Pedro Valley from Montezuma Pass.

Alternative D: Create an International Experience for Visitors

The concept of alternative D would be to develop a fuller international experience for visitors by finding new ways for the public to appreciate and understand the international aspects of the memorial.

The **conservation prescription** in alternative D would contain all lands not included in other prescriptions. The abandoned powerline along the Montezuma Pass road would be removed and the area revegetated

with native species. Abandoned roads would be restored to natural contours and revegetated. Grazing would not be permitted in the Montezuma allotment.

In the **education prescription** would be the trail from Montezuma Pass to Coronado Peak (with updated interpretive media), the trail to Coronado Cave (with added interpretive media), and the grasslands north of the main road. Part of the trail to Coronado Peak might be made accessible for visitors with disabilities. A new interpretive trail would be developed north of the main road in the grasslands, possibly using Windmill Road, but not going into the Joe's Spring allotment.

The **visitor services prescription** would consist of the area around the visitor center, the picnic area, parking atop Montezuma Pass, the main road, East Forest Lane from the main road to the border, and the Montezuma Ranch area. East Forest Lane would be upgraded to two lanes, and a new structure would be built at the end of that road to offer shelter from weather and views into Mexico. In this commemorative feature, which could become a main attraction of the memorial, interpretive media would foster understanding and appreciation through a historical perspective of the region as illustrated by the Coronado Expedition, encouraging international amity.

An educational center with space for staff offices would be built in the Montezuma Ranch area. The center would be designed to blend into the environment, with the surrounding area landscaped so that it would not detract from the views from Coronado Peak. The Montezuma Ranch structures would be evaluated for national register eligibility. The structures found ineligible would be demolished. If any structures were found eligible for the national register, the staff would consult with the Arizona state historic preservation office to determine what features could be removed, adaptively used, or documented and then removed. Any

structures found eligible might be adaptively used as part of the educational center.

The views from Montezuma Pass would be preserved, with the roads to the educational center and the commemorative feature designed to minimize harm to the vista. The visitor center would be expanded and rehabilitated, with updated interpretation and more office and storage space. Interpretative themes would relate to the memorial's international aspects.

The interpretive trail at the visitor center would be removed. The visitor center would be evaluated for national register eligibility, and any work would be planned to protect the contributing features. More parking for visitors and NPS staff would be added; some could be in the present picnic area. The road to the picnic area would be upgraded and picnic sites added. The visitor shelter at Montezuma Pass would be converted into a minimal contact station (staffed at peak times); at some later time it might become a sheltered shuttle stop.

The **operations / special use prescription** in alternative D would contain the staff housing, the maintenance area, private inholdings, and a utility corridor. A new four-unit structure might be built to house temporary employees and others at the memorial. All development would be screened from the road by vegetation.

The memorial would explore the feasibility of sponsoring Coronado-related events at various universities to promote international understanding. These events might include onsite or offsite lectures and cultural activities. In addition, The memorial would support the preservation of the regional ecosystem, possibly working with partners to preserve the views of the San Pedro Valley from Montezuma Pass.

Alternative E: Enhance Interpretation and the Efficiency of Operations

The concept of alternative E would be to offer an enhanced experience for visitors while creating a more sustainable national memorial and seeking new ways to educate the public about the significance of the Coronado Expedition. A new visitor/educational center would be created, and a new interpretive trail would be developed.

The **conservation prescription** would contain all lands not included in other prescriptions. The abandoned powerline along the road to Montezuma Pass would be removed and the area revegetated with native species. Grazing in the Joe's Spring allotment would be ended. East Forest Lane would continue to be used for NPS operations and as an access road to the Montezuma grazing allotment. The Montezuma Ranch would be managed as described in the discussion of alternative A, page vi.

The **education prescription** in alternative E would consist of the trail from Montezuma Pass to Coronado Peak, the trail to Coronado Cave, and the grasslands north of the main road. The interpretive media on both trails would be updated. Another trail would be added between the visitor center and the entrance.

The **visitor services prescription** would contain the present visitor center, the picnic area, the parking atop Montezuma Pass, the main road, part of Windmill Road, and the new visitor/educational center, which would be about 1.2 miles west of the east entrance. A trail would be developed at that center to interpret the grasslands, and another trail would be created between the current visitor center and the new visitor and educational center. From the new center, visitors would have panoramic views of the San Pedro River Valley and the United States-Mexico border. These views would add to the staff's ability to tell the human and natural history stories significant to Coronado National Memorial.

The principles of sustainable design would be used to create this building typical of the Spanish colonial period, which would blend into the environment as much as possible.

The present visitor center, which may be eligible for national register listing, would be converted into administrative offices. It would be evaluated for national register eligibility, and any work done on the building would be planned to protect the eligible features. The main road, trailheads, parking, picnic area, and restrooms would be unchanged, with social trails revegetated. Windmill Road would be made into a two-lane paved road, with the alignment changed slightly to give access to the visitor/educational center. The visitor shelter at Montezuma Pass would be converted into a minimal contact station and possibly, at a later date, a sheltered shuttle stop.

The **operations / special use prescription** would include the staff housing, the maintenance area, private inholdings, and a utility corridor. A new four-unit structure might be added to house temporary employees and others temporarily staying at the memorial. All development would be screened from the road by vegetation.

All interpretive themes would be equally emphasized in alternative E, with strong importance given to working with various groups to tell the memorial's stories and reach beyond its boundaries. Partnerships would be created with local schools, the U.S. Forest Service, the Bureau of Land Management, and others, and interpretive programs would be developed in conjunction with Mexican groups.

The memorial would support the preservation of the regional ecosystem, possibly working with partners to preserve the views of the San Pedro Valley from Montezuma Pass.

ENVIRONMENTAL CONSEQUENCES

The planning team evaluated the potential consequences that the actions of each alternative would have on natural resources, cultural resources, visitor understanding and recreational resources, and the socioeconomic environment. The beneficial or adverse effects were categorized as either short term or long term, and their intensity was rated as negligible, minor, moderate, or major. The impacts of the alternatives are compared in table 9 (p. 77).

Effects from Alternative A

Natural Resources. Long-term local negligible to minor adverse effects on **soils** and **vegetation** would be caused by human activity at developed sites and along trails, the ongoing maintenance of existing structures and roads, and the rehabilitation of existing structures as funds permitted. The associated ground disturbance could encourage invasive nonnative plant species to increase. Removing the Montezuma Ranch structures would cause trampling and the uprooting of vegetation, a short-term negligible to minor local adverse effect on about 5 acres of soils and vegetation (less than 1% of the memorial's total acreage). Revegetating the area after the structures were removed would restore the overall integrity of the vegetative community. Minor adverse effects on soils and vegetation (which stabilizes soils) would continue in the grazing allotments from erosion and compaction by cattle hooves. However, implementation of the new *Livestock Management Plan* is reducing stocking levels and modifying the season of use, allowing native grass species to increase and improving range condition. These long-term beneficial effects on soils and vegetation would be negligible to minor.

Developing a fire management plan would reduce hazardous fuels, diminishing the potential for wildland fire in the memorial and beyond its boundaries.

Threatened, endangered, or sensitive species would not be adversely affected by alternative A. Removing the Montezuma Ranch structures and restoring and revegetating the area would result in more agave plants, increasing the available food for nectar-feeding bats. It also would increase the habitat available for small rodents and insects, an negligible to minor beneficial effect on the loggerhead shrike.

Water quality in Coronado National Memorial would continue to be adversely affected by the use of current trails, roads, and facilities adjacent to drainages, which would make streambanks unstable. Maintaining and using existing structures might cause the loss of riparian vegetation in small areas through trampling and uprooting. The long-term adverse effects on wetlands from these causes would be negligible. The short-term adverse effect on water quality from removing the Montezuma Ranch structures would be negligible because it would not be near drainages, and mitigative measures would reduce soil erosion. Restoring and revegetating the area after building removal would reduce compaction and wind erosion.

Grazing, even at reduced levels under the *Livestock Management Plan*, would continue to degrade watersheds, causing soil erosion, reduced plant cover, and altered plant communities. However, sedimentation, fecal coliform, and other microbes would decrease, and the effects on grazing in riparian areas would be reduced. The long-term adverse impacts on water quality and riparian areas from continued grazing would be minor.

Removing the Montezuma Ranch structures and restoring and revegetating the area would improve grassland habitat, benefiting **wildlife** and giving small rodents more habitat, but removing the structures would result in long-term negligible adverse effects on wildlife. Mitigating measures would reduce the effects on rare or uncommon wildlife species. Continued management of grazing according to the *Livestock Management Plan* would

improve small mammal habitat and bird nesting habitat. Continued grazing would reduce forage and cause habitat loss, a minor long-term adverse impact on wildlife.

Cultural Resources. An archeological survey of the Montezuma Ranch would be completed, and any **archeological resources** found there would be preserved in place, a negligible long-term beneficial effect. Archeological sites have been damaged by livestock grazing. The continued disturbance of archeological sites by cattle would cause a long-term minor to moderate adverse impact. Continuing efforts of the memorial staff to identify and protect archeological resources would be beneficial to those resources.

Historic structures in the memorial would benefit from ongoing efforts to identify and preserve them, resulting overall in a long-term negligible to minor beneficial effect. Before any action was taken regarding the early 20th century Montezuma Ranch structures, a formal determination of their national register eligibility would be completed.

Ethnographic resources would benefit from inventories that would be developed, but the long-term minor beneficial effect would be partly offset by a lack of in-depth programs sponsored by the memorial. Therefore, the overall long-term beneficial effect on ethnographic resources would be negligible. American Indians would continue gathering items important to their culture on the memorial's lands. Visitors' understanding and appreciation of the Indian and Hispanic viewpoints about the Coronado Expedition would continue to be limited.

Cultural landscapes would benefit from the continued efforts of the national memorial staff to maintain such landscapes. Any construction in the memorial would be done so as to protect the views from Montezuma Pass. Identifying and preserving cultural landscapes would result in a long-term minor beneficial effect. Removing the visually

intrusive Montezuma Ranch structures would cause a long- term minor beneficial effect on the views from Montezuma Pass. Development outside the memorial could result in short- term and long- term minor to moderate adverse impacts on cultural landscapes.

Visitor Understanding and Recreational Resources. Visitor *access to resources* would be unchanged under alternative A, with most visitors spending one to two hours at the memorial's many attractions. Access for visitors with disabilities would continue to be inadequate. Thus, the ability of visitors to experience valuable resources would be limited, a negligible to minor adverse effect.

Continuing the existing interpretive materials and services would be helpful in *interpretation and orientation*, giving visitors information and decreasing physical effects on resources. Continued crowding at the visitor center would damage the quality of the visitor experience, a long- term moderate adverse effect.

If *visitor numbers* and the demand for *recreational resources* continued to increase with no corresponding improvement in visitor services, there would be local minor to moderate long- term adverse impacts on the visitor experience. The memorial's facilities would deteriorate, and deferring maintenance to divert funds to recreational services could make the memorial less appealing as a recreation site. Removing the Montezuma Ranch structures and restoring and revegetating the area would enable visitors to enjoy an uninterrupted view of the San Pedro Valley from the Montezuma Peak scenic lookout, improving scenic values, a long- term minor to moderate beneficial effect. With increasing demands for recreation and opportunities to observe wildlife and vegetation, continuing grazing in the memorial would have a long- term minor to moderate adverse impact on visitors wanting to experience natural resources.

The Socioeconomic Environment. With few improvements in recreational facilities under alternative A, *recreational use* in the memorial would increase at about the same rate as visitation. Facilities and attractions would deteriorate through overuse, making the memorial less appealing, a negligible long- term adverse effect.

Cattle *grazing* in the memorial would continue to follow the actions set forth in the "Livestock Management Plan," but increased recreational use would lead to more complaints by recreational users about cattle. However, the economic effect on grazing would be negligible.

Alternative A would result in negligible effects on the *local and regional economy* from new jobs and visitor spending. Continuing grazing in the memorial would not cause any economic changes in grazing fees or cattle production. The memorial's ability to provide additional people trained in fighting wildland fires would be a minor long- term beneficial effect on the region.

Effects from Alternative B

Natural Resources. Ground disturbance to build the visitor center annex and add pullouts, new trails, and trailheads would affect less than 1 acre of *soils* and *vegetation* in a previously disturbed area, a long- term negligible to minor local adverse impact. The adverse effects on soils and vegetation from removing the Montezuma Ranch structures would be short term and negligible to minor because mitigative measures would minimize erosion and limit construction activities. Restoring and revegetating the site would offset the adverse effects and improve the ecosystem's health and integrity. Restoring and revegetating East Forest Lane and removing powerlines along the Montezuma Pass road would affect soils and vegetation on less than 50 acres, with negligible to minor long- term adverse effects. Ending grazing in the memorial would reduce nonnative species

and reestablish native vegetation, a long- term minor beneficial effect.

Threatened, endangered, or sensitive species would not be affected by the construction of the visitor center annex and hiking trails, parking lots, and pullouts. These actions would not alter the population of agave plants or affect the small mammals that are prey for loggerhead shrikes. Removing the Montezuma Ranch structures and restoring the area would improve the habitat for agave plants and small mammal species, resulting in negligible to minor beneficial effects on nectar- feeding bats and loggerhead shrikes. Ending grazing in the memorial would stop cattle from eating the memorial's agave plants and might increase the prey base and nesting habitat for loggerhead shrikes.

Long- term negligible to minor adverse impacts on **water quality** would result from building a visitor center annex and adding parking, pullouts, and trails. Parts of two accessible trails that cross drainages might need to be adjusted for slope requirements, which would reduce soil erosion in the riparian habitat. Reestablishing streambank vegetation after construction would reduce those effects. Native riparian vegetation would be restored, a long- term negligible to minor beneficial effect on riparian habitats. Removing the Montezuma Ranch structures and restoring and revegetating the area would cause negligible effects on water quality and wetlands. The long- term beneficial effects from restoring East Forest Lane and the powerline area would be negligible to minor. Ending grazing in the national memorial would stop livestock disturbance of soils and vegetation in riparian areas, reducing streambank erosion, a short- term minor beneficial effect.

Expanding the visitor center and adding trails would give **wildlife** more access to habitat, a negligible to minor beneficial effect from alternative B. However, slow or sedentary species such as amphibians and reptiles would be more at risk for adverse effects from

construction. Some individuals might be lost, affecting their populations in the memorial. However, with mitigation to reduce the impacts, the overall long- term adverse effects on wildlife would be negligible to minor.

Removing the Montezuma Ranch structures, with mitigating measures to reduce impacts on rare or uncommon species, would cause long- term negligible adverse effects on wildlife. Restoring and revegetating the area would improve grassland habitat, a long- term negligible to minor benefit. Restoring and revegetating East Forest Lane and removing the powerline along the main road would increase habitat and food for many species of small mammals, nesting birds, and reptiles, a long- term negligible to minor beneficial effect. Closing East Forest Lane to vehicles would reduce the indirect effects of human presence. Ending grazing in the memorial would improve wildlife habitat and forage.

Cultural Resources. The impacts on **archeological resources** from alternative B would be partially or fully mitigated by sensitive siting and by designing facilities in relation to the resources. Any resources found by an archeological survey of the Montezuma Ranch would be preserved in place, a negligible long- term beneficial effect. Ending grazing in the memorial would help to conserve archeological resources; hence, the long- term beneficial effect on archeological resources would be negligible to minor.

The national memorial's ongoing efforts to identify and preserve **historic structures** would benefit these resources. Evaluating the Montezuma Ranch structures and the visitor center for eligibility for the National Register of Historic Places would produce a long- term negligible beneficial effect on historic structures.

Known **ethnographic resources** would not be affected by any action in alternative B. Long- term moderate to major beneficial effects would result from the national memorial's educational and interpretive programs, which

SUMMARY

would promote the protection of tangible and intangible resources, and from efforts to emphasize the area's multicultural heritage.

Any effects on **cultural landscapes** from the minimal developments of alternative B would be partially or fully mitigated by sensitive siting and design, resulting in long- term minor to moderate beneficial effects on cultural landscapes.

The annex would enable the staff to present more in- depth interpretation of the memorial's natural and cultural resources, a long- term minor to moderate beneficial effect.

Visitor Understanding and Recreational Resources. Visitors' **access to resources** and cultural exhibits would be improved by developing four new trails, two of which would be made accessible for mobility- impaired visitors. Two new trails to be developed would be loop trails in the grasslands, one south of the main road near the Montezuma Ranch and one north of the entrance, the latter using part of the old Windmill Road. A trail partially accessible for visitors with disabilities also would be added in the grasslands north of the entrance. The present interpretive trail near the visitor center would be removed to allow the addition of the annex, but a new interpretive trail would be developed between the visitor center and the entrance to the memorial.

The memorial's grasslands would be more easily available for hiking and birding after the end of grazing in the memorial, a negligible to minor long- term beneficial effect. Congestion would be reduced and views would be more accessible after the addition of parking and pullouts. All these actions would cause long- term minor to moderate beneficial effects on the visitor experience.

Interpretation and orientation would be improved by upgraded interpretive materials and expanded outreach programs. Visitors would have an opportunity to understand the story

of Coronado National Memorial, a moderate long- term beneficial effect on the visitor experience.

Enlarging the memorial's facilities would accommodate larger **visitor numbers**, improving **recreation** opportunities, a long- term minor to moderate beneficial effect on the visitor experience. Removing the Montezuma Ranch structures and restoring and revegetating the area would make available an uninterrupted view of the San Pedro Valley from the Montezuma Peak lookout, improving scenic values, a long- term minor to moderate beneficial effect. Ending grazing in the memorial would let visitors experience the grasslands' natural resources, a negligible to minor beneficial effect.

The Socioeconomic Environment. The visitor service enhancements, resource conservation measures, and outreach efforts of alternative B would enable the memorial to accommodate more **recreational use** without reducing the quality of the recreational experience, a moderate long- term beneficial effect on recreation.

Ending **grazing** in the memorial would benefit recreational use, but it would cause a negligible adverse effect on the county's economy. The loss of the payment of grazing fees to the National Park Service would be a negligible adverse effect on the memorial's operating budget.

The **local and regional economy** would receive negligible beneficial effects under Alternative B from new jobs, more spending caused by increased visitation, and NPS expenditures for construction labor and supplies. The availability of more trained firefighters would be a minor long- term beneficial effect on the region.

Effects from Alternative C

Natural Resources. Adding more parking would cause negligible to minor effects on

soils and **vegetation** in a previously disturbed area of less than 1 acre. More areas would be restored and revegetated in alternative C than in the other alternatives. Removing the Montezuma Ranch structures would cause negligible to minor short- term local adverse effects on soils and vegetation, but mitigative measures would be used. Restoring construction sites and the Montezuma Ranch area would reduce nonnative plants and bring back native species, improving ecosystem health and integrity, a local long- term local negligible to minor beneficial effect. Trail changes to provide better access would cause negligible to minor damage of soils and vegetation. Ending grazing in the memorial would reduce nonnative plants and increase native vegetation, a long- term minor beneficial effect.

Threatened, endangered, or sensitive species would not be affected by the addition of parking. Removing the Montezuma Ranch structures and restoring the area would establish habitat for agave plants and small mammal species, a negligible to minor beneficial effect for nectar- feeding bats and loggerhead shrikes. Ending grazing in the memorial would stop cattle consumption of agave plants, increasing the prey base and nesting habitat for loggerhead shrikes.

The effects on **water quality** from adding more parking would be negligible because the small parking area would not be in riparian habitat or adjacent to a stream channel. Restoring and revegetating more sites than in the other alternatives would reduce sedimentation into drainages, a long- term minor beneficial effect on water quality and the riparian habitat. Ending grazing in the memorial would produce a long- term minor beneficial effect on water quality.

The adverse effects on the memorial's **wildlife** from adding parking and upgrading trails would be negligible. Removing the Montezuma Ranch structures would cause negligible short- term adverse effects on wildlife, with mitigating measures reducing the impacts on

rare or uncommon species. Restoring and revegetating areas would improve grassland habitat, benefiting wildlife species. Ending grazing in the memorial would improve habitat and forage, a long- term minor beneficial effect on wildlife.

Cultural Resources. Alternative C would not result in any effects on **archeological resources** because development would be limited, most of it in previously disturbed areas. Thus, the long- term beneficial effects on archeological resources would be negligible to minor.

The national memorial's various potential **historic structures** — specifically, the visitor center and the Montezuma Ranch structures — would be formally evaluated for their eligibility for listing on the National Register of Historic Places. Any ranch structures found ineligible for listing would be torn down; this would result in no effect. Any structures determined to be eligible would be stabilized and preserved, a long- term negligible beneficial effect on these resources. The visitor center would be retained.

The memorial's **ethnographic resources** would be protected from damage in alternative C because development would be limited. Restoring and revegetating roads, powerline areas, and areas with nonhistoric structures would make more areas suitable for ethnographic use, resulting in long- term negligible to minor beneficial effects on ethnographic resources.

Restoring **cultural landscapes** in the memorial to appear like those at the time of the Coronado Expedition would result in a negligible to minor long- term beneficial effect.

More in- depth interpretation would be feasible at the remodeled visitor center, but there could be more risk of vandalism or deterioration of the items. Overall, the long- term effects of alternative C on the collections would be negligible and beneficial.

Visitor Understanding and Recreational Resources. Visitors' *access to resources* would be enhanced by upgrading the trail at the visitor center and making it accessible to mobility- impaired visitors, but the beneficial effects would be negligible because the trail is small. Ending grazing in the memorial would enable some visitors to use grassland areas, but with no trails being developed in the allotment areas, the use would remain limited, a negligible beneficial effect on the visitor experience.

Interpretation and orientation would be improved by the memorial staff's efforts with other groups to reach beyond the boundary and tell the memorial's story. This would give visitors an opportunity to appreciate and understand Coronado National Memorial's story, a minor long- term beneficial effect on the visitor experience.

Visitor numbers would increase under alternative C, and opportunities for *recreation* would be improved by upgrading the interpretive trail, particularly for mobility- impaired visitors. Removing the Montezuma Ranch structures and restoring and revegetating the area would enable visitors to enjoy an uninterrupted view of the San Pedro Valley from the Montezuma Peak scenic lookout, improving scenic values, a long- term minor to moderate beneficial effect. Congestion would be reduced by adding parking, also a long- term minor to moderate beneficial effect.

The Socioeconomic Environment. In alternative C, *recreational use* would benefit from increased recreational services, improved facilities, better controls, and enhanced visitor services. This would result in minor long- term beneficial effects on recreation.

Ending *grazing* in the memorial would cause a negligible long- term beneficial effect on recreational use and a negligible adverse effect on the county economy from reduced cattle production. Ending the payment of grazing fees to the National Park Service would have a

negligible adverse effect on the memorial's operating budget.

Alternative C would cause negligible beneficial effects on the *local and regional economy* from new jobs, more spending caused by greater visitation, and NPS spending for construction labor and supplies. Negligible adverse effects would result from decreased cattle production. The availability of more personnel trained in firefighting would be a minor long- term beneficial effect on wildland fire control in the county.

Effects from Alternative D

Natural Resources. Expanding the visitor center and adding picnic sites would cause negligible to minor adverse effects on previously disturbed *soils* and *vegetation*. The short- term and long- term adverse effects from paving, creating parking areas and trails, and building an educational center would be negligible to minor because the areas affected would be small and best management practices would reduce the damage. Only the vegetation adjacent to developments would be affected, and the harm would ultimately diminish as the area revegetated.

Removing the Montezuma Ranch structures and replacing them with new buildings or adapting them for use as an educational center would cause the trampling and uprooting of grassland vegetation, resulting in negligible adverse impacts on less than 20 acres. Adapting the existing structures for use as the educational center would cause fewer impacts than would building new structures because less construction would be needed. The local adverse effects would be negligible, as would the effects on vegetation throughout the memorial from either scenario. Adverse impacts on soils and vegetation from grazing in the Joe's Spring allotment would continue, but the minor long- term impacts would be offset by the beneficial effects of ending grazing in the Montezuma allotment.

The populations of agave plants used by **threatened, endangered, or sensitive species** would not be affected by the development-related activities of alternative D, although individual plants might be disturbed by trail construction in grasslands or by paving roads and parking areas. Removing the Montezuma Ranch structures might cause the loss of individual agave plants but would not adversely affect the memorial's total agave population, and it would not measurably affect small mammal prey species, especially those that are mobile or common. Adapting the ranch structures for use as an educational center would cause negligible to minor adverse impacts on sensitive species.

Expanding the visitor center and adding picnic sites in previously disturbed areas would cause negligible effects on **water quality**. The development would not take place in riparian habitat or near drainages, and mitigating measures would minimize erosion and limit construction to the immediate area. Paving East Forest Lane and developing trails would cause short- term minor adverse effects on water quality and negligible to minor adverse effects on riparian habitat. In the long term, the impacts would be negligible because riparian vegetation along the streambank would recover. Riparian habitat would not be affected by removing the Montezuma Ranch structures and replacing them with new buildings or adapting them for the educational center. Continuing grazing in the Joe's Spring allotment would cause long- term minor adverse effects on water quality and riparian areas through continued streambank erosion and sedimentation, but ending grazing in the Montezuma allotment would offset these effects.

Negligible to minor adverse effects on **wildlife** would be caused by expanding the visitor center and adding picnic sites in previously disturbed areas. Removing the Montezuma Ranch structures would result in long- term negligible harm to wildlife, but mitigative measures would reduce the impacts on rare or uncommon species. Adding new trails also

would adversely affect some wildlife species in the long term, but the effects would be negligible to minor because the areas affected would be small and previously disturbed. Widening and paving East Forest Lane would improve visitor access, resulting in roadkill and the continued fragmentation of habitat, a local long- term minor adverse effect on wildlife. Ending grazing in the Montezuma allotment would increase grassland forage and improve riparian habitat, a long- term minor benefit for wildlife.

Cultural Resources. The many ground-disturbing actions in alternative D would increase the possibility of affecting **archeological resources**. However, about 70% of the actions would occur in formerly disturbed areas. The areas to be disturbed could contain unknown archeological resources, and if any were found, actions would be taken to protect them. Continuing grazing in the Joe's Spring allotment would allow more disturbance of archeological resources, mainly lithic scatters, but stopping grazing in the Montezuma allotment would end the risk of damage in that area. The continued damage of archeological sites by cattle would be a long- term negligible to minor adverse effect. The continuing identification and location of archeological resources would result in their being preserved in place, a negligible long- term beneficial effect. Overall, the long- term effects on archeological resources from alternative D would be negligible and adverse.

The **historic structures** on the Montezuma Ranch would be formally evaluated for their eligibility for listing on the National Register of Historic Places, as would the visitor center. Any ranch structures found ineligible for listing would be torn down; this would result in no effect. If any structures were found eligible for the national register, the staff would consult with the Arizona state historic preservation office to determine if they could be removed, adaptively used, or documented and then removed. If the visitor center was found eligible, the rehabilitation proposed in this alternative would result in a long- term

moderate beneficial effect. The overall long-term effect on historic structures from alternative D would be negligible and beneficial.

Ethnographic resources could be affected by improved access from new and upgraded trails and roads, which could bring visitors to areas previously visited very little. Thus, alternative D could have a long-term negligible adverse impact on ethnographic resources.

Alternative D would be more likely to affect **cultural landscapes** than the other alternatives because of the variety of actions involved (building roads, facilities, and trails). Efforts would be made to perpetuate the appearance of the area as it looked to the Coronado Expedition. Although care would be taken in designs and vegetative screening, vehicles on roads and in parking lots still could be visually intrusive. Overall, the long-term effect of alternative D on cultural landscapes would be adverse and negligible to minor.

Visitor Understanding and Recreational Resources. Alternative D would improve visitors' **access to resources** because paving East Forest Lane so that vehicles could reach the new commemorative feature would enable people to experience the natural resources of the grasslands, a long-term moderate to major beneficial effect. Visitors also could experience the grassland habitat of the Montezuma grazing allotment, a negligible to minor beneficial effect because only a small number of visitors use the memorial's trails. Access to natural resources and cultural exhibits for people with disabilities would increase, a negligible to minor beneficial effect.

Interpretation and orientation would be enhanced by improved interpretive materials and expanded outreach programs, which would emphasize the memorial's mission, purpose, and significance. Opportunities for visitors to learn about and understand the

memorial's resources would be a moderate to major beneficial effect.

The congestion of **visitor numbers** would be reduced in alternative D by the addition of an educational center and a group picnic area. There would be short-term minor to moderate adverse effects on **recreation** from construction noise and the temporary closure of some areas, but the expanded facilities would reduce crowding and enable the memorial to accommodate more visitors, a moderate to major beneficial effect. With increasing demands for recreation and opportunities to observe wildlife and vegetation, continuing grazing in one allotment would have a long-term negligible to minor adverse impact on visitors wanting to experience the memorial's natural resources.

The Socioeconomic Environment. In alternative D, **recreational use** would benefit from enhanced visitor services, resource conservation measures, and outreach efforts. The memorial could accommodate more visitation without harming the quality of the recreation experience, a moderate long-term beneficial effect.

Ending **grazing** in the Montezuma allotment would prevent some visitor-livestock conflicts. The ranchers who would lose the grazing capacity would not be able to replace it, an adverse effect on individual ranchers, but the countywide adverse effect would be negligible. Therefore, eliminating grazing from one allotment would result in a minor long-term beneficial effect on recreational use and a negligible adverse effect on the county economy from reduced cattle production. The memorial would be able to offer more recreational opportunities by placing recreational amenities south of the main road, a minor beneficial effect on recreation.

Alternative D would cause negligible beneficial effects on the **local and regional economy** from new jobs, more spending caused by greater visitation, and NPS spending for construction labor and supplies.

Negligible adverse effects would result from decreased cattle production. The availability of more personnel trained in firefighting would be a minor long- term beneficial effect on wildland fire control in the county.

Effects from Alternative E

Natural Resources. Local short- term and long- term negligible to minor adverse effects on **soils** and **vegetation** would result from building a new visitor center and a hardened parking area in the grassland now occupied by the Joe's Spring allotment. This would result in soil erosion and compaction on previously grazed land. Paving roads, adding parking areas, and developing trails would cause short- term and long- term negligible to minor damage of soils and vegetation. Those effects would diminish over time as vegetation along the road recovered. Removing the structures from the Montezuma Ranch would cause short- term negligible to minor adverse impacts on soils and vegetation, which would be offset by long- term beneficial effects from restoring and revegetating the site, reducing compaction and increasing permeability, a local long- term negligible to minor beneficial effect. Continuing grazing in the Montezuma allotment would cause minor long- term adverse impacts on soils and vegetation, but they would be offset by eliminating grazing from the Joe's Spring allotment.

Alternative E would affect **threatened, endangered, or sensitive species** because the ground- disturbing activities associated with buildings, trails, and road access into the grasslands would disturb vegetation and wildlife. Removing the Montezuma Ranch structures and restoring and revegetating the area would result in more habitat for agave plants and more ground cover and habitat for small rodent species. Revegetation also would benefit nectar- feeding bats and loggerhead shrikes by increasing the available food. Continuing grazing in the Montezuma allotment would continue negligible to minor adverse effects on the vegetation and wildlife

on which sensitive species rely for food and habitat.

Cultural Resources. The potential to affect **archeological resources** would increase because many of the ground- disturbing actions in alternative E would take place in previously undisturbed areas. Actions would be taken to protect any unknown archeological resources found in the areas to be disturbed. Continuing grazing in the Montezuma allotment would allow further disturbance of archeological resources, mainly lithic scatters, but eliminating grazing from the Joe's Spring allotment would end the possibility of grazing damage in that area. The continued disturbance of archeological sites by cattle would result in a long- term minor to moderate adverse impact on archeological resources. The continuing identification and location of archeological resources would result in their being preserved in place, a negligible long- term beneficial effect. Overall, the actions of this alternative would result in a long- term negligible to minor adverse impact on archeological resources.

The visitor center and the **historic structures** on the Montezuma Ranch would be formally evaluated for their eligibility for listing on the National Register of Historic Places. Any ranch structures found ineligible for listing would be torn down; this would have no effect. If any structures were found eligible for the national register, the staff would consult with the Arizona state historic preservation office to determine if they could be demolished. If the visitor center was found eligible, its rehabilitation would result in a long- term moderate beneficial effect. The overall long- term effect on historic structures from alternative E would be negligible and beneficial.

The possibility of adversely affecting **ethnographic resources** would be greater in alternative E than in some of the other alternatives because visitors would have more access to the grasslands in the national memorial. The long- term adverse effects of this alternative

on ethnographic resources would be negligible.

Cultural landscapes could be affected by the construction of roads and trails and the removal of nonhistoric structures; however, none of the roads, trails, or structures have been identified as being part of cultural landscapes. Visual intrusions on the views replicating the appearance of the country at the time of the Coronado Expedition could occur from vehicles on roads and in parking lots, although the designs and vegetative screening would be planned with care. The long-term adverse effects on cultural landscapes from alternative E would be minor.

Visitor Understanding and Recreational Resources. Visitors' **access to resources** would be enhanced in alternative E by the ability to visit grassland habitats now used for grazing in the Joe's Spring allotment, a negligible to minor beneficial effect. Minor beneficial effects would result from increased access for visitors with disabilities to trails leading to natural resources and cultural exhibits. A paved road to the visitor center would offer access to an area not previously accessible by vehicles, a long-term moderate to major beneficial effect. Removing the Montezuma Ranch structures and restoring and revegetating the area would enable visitors to enjoy an uninterrupted view of the San Pedro Valley from the Montezuma Peak scenic lookout, improving scenic values, a long-term minor to moderate beneficial effect.

Minor beneficial effects for **interpretation and orientation** would result from the memorial staff's working with various groups to tell the memorial's international stories. A new visitor center would enable people to enjoy a view of the landscape and the valley. This would add a major attraction that could help visitors understand and appreciate the memorial's history.

Larger **visitor numbers** could be accommodated in the new, roomier visitor/educational

center, which would help to disperse visitors and relieve crowding, a long-term moderate to major beneficial effect. The long-term adverse effects on **recreation** from new developments that would affect the viewshed would be negligible. With increasing demands for recreation and opportunities to observe wildlife and vegetation, continuing grazing in one allotment would have a long-term negligible to minor adverse impact on visitors wanting to experience natural resources.

The Socioeconomic Environment. In alternative E, **recreational use** would benefit from improved facilities and visitor services, resource conservation actions, and outreach efforts. The memorial could accommodate more visitation without harming the quality of recreation that visitors would experience. This would be a moderate long-term beneficial effect.

Ending **grazing** in the Joe's Spring allotment would avert some human-livestock conflicts. The ranchers who would lose the grazing capacity would not be able to replace it, an adverse effect on individual ranchers, but the countywide effect would be negligible. Therefore, eliminating grazing from one allotment would result in a minor long-term beneficial effect on recreational use and a negligible adverse effect on the county's economy from reduced cattle production. The national memorial could offer more recreational opportunities by placing facilities north of the main road, a minor beneficial effect on recreational use.

Negligible beneficial effects on the **local and regional economy** would result from alternative E because of new jobs, added spending by more visitors, and NPS payments for construction labor and supplies. Negligible adverse effects would be caused by decreased cattle production. The availability of more trained firefighters would be a minor long-term beneficial effect on wildland fire control in the county.

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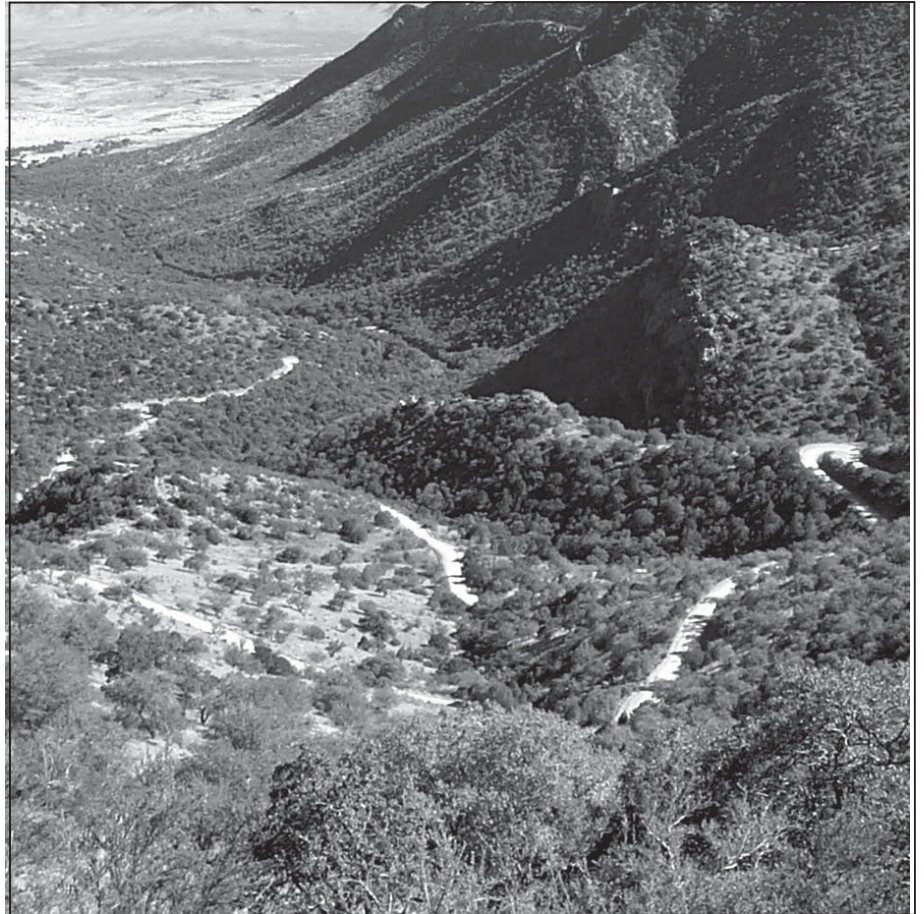
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INTRODUCTION

THE PLAN

This *Final General Management Plan / Environmental Impact Statement* contains analyses of four alternative future approaches for the management and use of Coronado National Memorial. A fifth “no- action” alternative represents the continuation of the current management direction into the future. This provides a basis for comparing the four “action” alternatives. One alternative has been identified as the alternative preferred by the National Park Service (NPS). The potential environmental consequences that could result from implementing each alternative have been identified and assessed.

General management plans are intended to be conceptual documents that establish and articulate a management philosophy and framework for decision making and problem solving in the area to be managed. These plans usually provide guidance over a period of 15 to 20 years.

Actions directed by general management plans or in subsequent implementation plans are accomplished over time. Budget restrictions, requirements for additional data or regulatory compliance, and competing national park system priorities may prevent the immediate implementation of many actions. Major or especially costly actions could be implemented 10 or more years into the future.

BRIEF DESCRIPTION OF THE AREA AND THE MEMORIAL

Coronado National Memorial (4,750 acres) is in Cochise County in southeast Arizona, 21 miles south of Sierra Vista and 26 miles west of Bisbee on the United States–Mexico border. The memorial is 50 miles south of Benson, on Interstate 10, off Arizona Highway

92. The road through the memorial is paved to about a mile beyond the visitor center and then becomes a mountainous dirt- and- gravel road that leads to Montezuma Pass. This dirt road continues west through the San Rafael Valley and over the Patagonia Mountains to Nogales — a slow, scenic drive.

The memorial’s significance can best be realized by placing it in a historical perspective. In the second quarter of the 16th century, the territory north of central Mexico was a massive, mysterious, unknown land to the Spanish. Spain’s explorers touched its fringes in Florida and along the Gulf of Mexico, but very little penetration of the interior had resulted. From 1539 to 1543, Spain undertook three major expeditions to explore the unknown lands to the north. Hernando de Soto explored Florida and what became the southeastern United States; Juan Rodríguez Cabrillo explored the west coast; and Francisco Vásquez de Coronado explored northwestern Mexico and what became the southwestern United States from California to Kansas. This was just 50 years after the Columbus voyages and 80 years before the Pilgrims landed at Plymouth Rock.

The 2.5- year Coronado Expedition (1540–1542) probably entered the United States via the San Pedro River Valley immediately east of the national memorial. No physical evidence has been found to substantiate the actual route of Coronado at the existing international boundary. However, the important aspect of the expedition was not its actual crossing point, but rather the international implications and the Hispanic cultural development initiated by these events. Today the Spanish language, Spanish and Mexican food, Spanish–Mexican influenced architecture, and other Hispanic customs are evident in our lives, not only in the Southwest, but throughout the nation.

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The area was authorized as an international memorial in 1941 and established as a national memorial in 1952 (see appendix A). The 4,750- acre memorial contains desert grasses and shrubs in lower elevations with oak woodlands and piñon- juniper forest in upper elevations. The terrain varies from open grasslands to steep ridges. The national memorial is encircled on three sides by ridges that rise more than 1,000 feet above the valley floor. The memorial preserves a wide array of plant and animal life native to the southwestern United States. More than 160 species of birds have been sighted in the memorial. In addition, a wide variety of mammals, birds, amphibians, and reptile species either inhabit the area or migrate through.

The memorial's interpretive offices are at the visitor center. Administrative offices, maintenance facilities, and several auxiliary structures are in the same area, as are two employee residences. A third (former) house has additional offices. Inside the visitor center, space for preparing and presenting programs is limited, and there is not enough room to accommodate school groups or tour groups. The interpretive media are dated but are being revised as funding permits.

Visitors who come into the visitor center can look at exhibits depicting the Coronado Expedition and the wildlife native to the area, shop for books, watch a film presentation, and receive orientation to the memorial. There is a short interpretive trail near the visitor center. A nearby picnic area is open during daylight.

Some visitors go to Coronado Cave, and only a small percentage of the people who visit the memorial hike the trails. Access to natural resources and cultural exhibits via the trails is limited because those trails were not designed for people with disabilities, but mobility-impaired people can get to the Montezuma

Pass overlook, the visitor center, and the picnic area.

Three miles west of the visitor center, the scenic overlook at Montezuma Pass offers views of the San Raphael Valley to the west, the San Pedro River Valley to the east, and Mexico to the south. Wayside signs placed around the Montezuma Pass parking lot can help visitors understand the area's physiographic and historical significance. From a short trail to Coronado Peak, one can see unobstructed vistas of the area through which the Coronado Expedition passed. Along the Coronado Peak trail are signs with quotations from the journals of the Coronado Entrada. At the peak a ramada shades visitors from the sun while they look at the San Pedro and San Rafael Valleys south into Mexico.

Windmill Road is in the grasslands south of the main road and just north of the memorial entrance. On its course to the international border, this two- lane dirt road crosses an ephemeral streambed. The picnic area, the pullout near the State of Texas mine, the main road, and the trail to the picnic area are in or adjacent to stream channels. The East Forest Lane road and the Windmill Road (dirt roads) cross drainages.

The Joe's Canyon trail branches off the Coronado Peak trail and continues 3 miles down to the visitor center and picnic area. Both of these trails are part of the national trails system. The Yaqui Ridge trail descends steeply from the Joe's Canyon trail down to International Boundary marker 102. Across from the parking area at Montezuma Pass begins the Crest Trail, which leads to Miller Peak. This also serves as the beginning of the developing Arizona Trail. When completed, that trail will end at the Utah border. Coronado Cave is reached by a trail 0.75 mile long that begins at the visitor center.

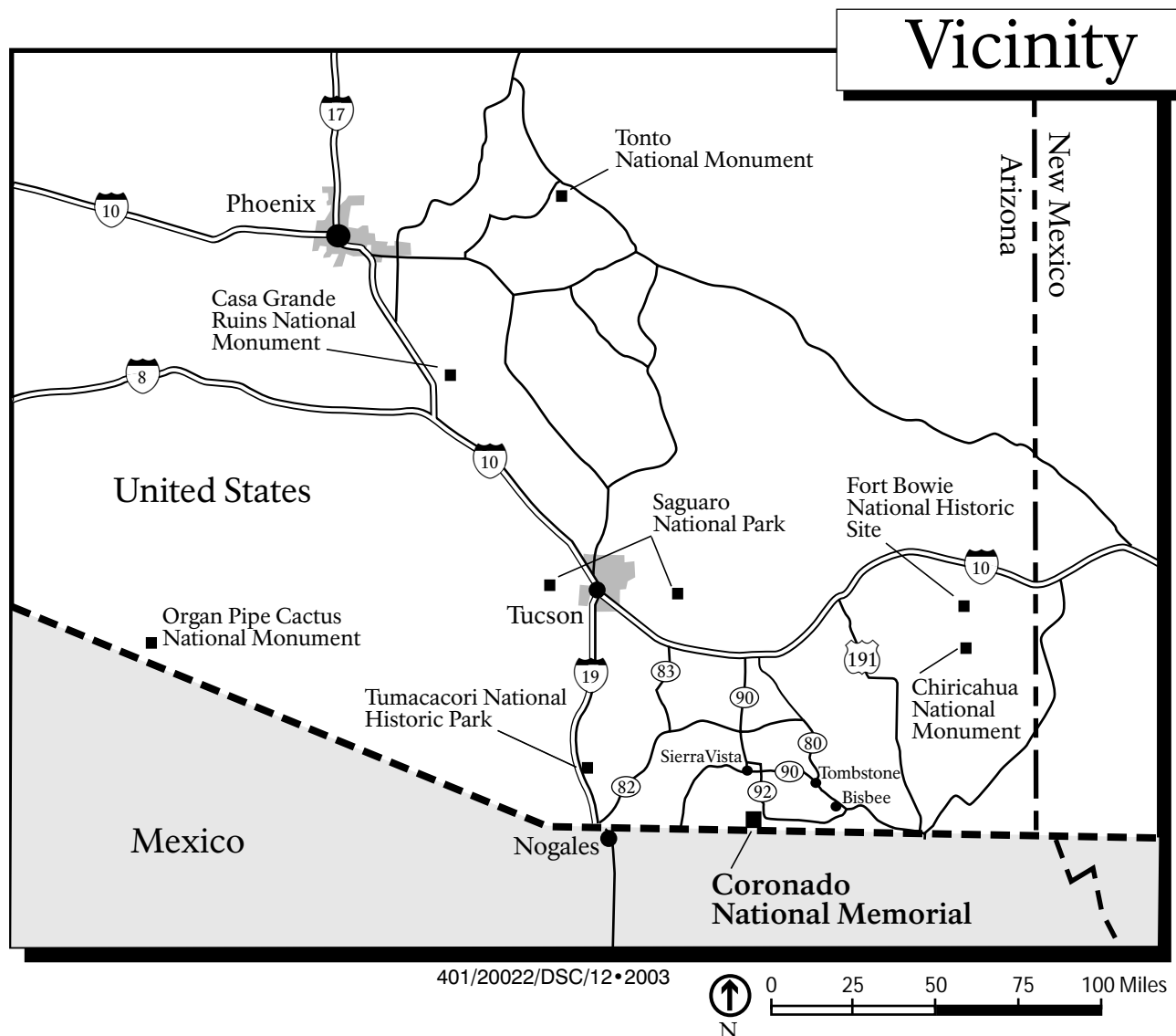


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Coronado National Memorial • Arizona

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PURPOSE OF AND NEED FOR THE ACTION

OVERVIEW

The purpose of this *General Management Plan* is to clearly define a direction and philosophy for resource preservation and visitor use at Coronado National Memorial. The existing plan needs updating to reflect the increasing use of the memorial. While the general management plan is being finalized, the memorial managers will continue to follow the laws, policies, and guidelines that the National Park Service is required to comply with as part of its standard operating procedures. These laws and guidelines include the National Environmental Policy Act of 1969 (NEPA), section 106 of the National Historic Preservation Act of 1966 (as amended), and *NPS Management Policies 2001*.

PURPOSE, SIGNIFICANCE, MISSION, AND THEMES

Agencywide laws, as well as laws, regulations, and policies specific to the unit, guide each unit in the national park system. Understanding this guidance and how it affects the memorial's mission is fundamental to planning for the memorial's future. This section highlights the mission (expressed as memorial purpose, significance, and mission statements), legal policies, and mandates that guide the management of Coronado National Memorial. These mission and mandate statements define the "sideboards" within which all management actions must fall. All alternatives to be considered in the general management planning effort must be consistent and contribute to fulfilling these missions and mandates.

The memorial's purpose and significance and the primary interpretive themes were used to develop all alternatives for this plan. The National Park Service defines interpretation as

providing information to visitors about the site so that they can understand why Congress set aside the park unit (in this case, Coronado National Memorial). In addition, interpretation provides a connection between visitors' interests and the meaning of the national memorial. The memorial's legislation, public comments, NPS policy, legal requirements, and resource values were analyzed in developing the following critical elements.

Purpose Statement

The following statement describes the primary reason that the memorial was created. It influences management priorities and is central to decisions about how the memorial should be developed and managed.

The purpose of Coronado National Memorial is to

permanently commemorate the explorations of Francisco Vásquez de Coronado and preserve and protect the cultural and natural resources within the memorial for public benefit and enjoyment.

Significance Statement

Coronado National Memorial is significant for the following reasons:

- ★ Coronado National Memorial is the only unit in the national park system that commemorates the Francisco Vásquez de Coronado Expedition of 1540–1542. When reporting to Congress in 1940 on the establishment of the memorial, the Committee on Public Lands and Surveys said,
Coronado's expedition was one of the outstanding achievements of a period marked by notable explorations. His expedition made known the vast extent

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and the nature of the country that lay north of central Mexico, and from the time of Coronado, Spaniards never lost interest in the country. In no small measure their subsequent occupation of it was due to the curiosity so created.

- ★ The creation of the memorial was not to protect any tangible artifacts related to the expedition. It was created to give visitors an opportunity to reflect upon the impact the Coronado Entrada had in shaping the history, culture, and environment of the southwestern United States and its lasting ties to Mexico and Spain.
- ★ The location was chosen for the panoramic views of the United States–Mexico border and the San Pedro River Valley, the route believed to have been taken by Coronado. It was hoped that this proximity to the border would strengthen binational amity and the bonds, both geographical and cultural, that continue to link the two countries.
- ★ The memorial, near the center of the Sky Island bioregion (the juncture of four major biogeographic provinces: Madrean, Sonoran, Chihuahuan, and Southern Rockies/Mogollon), preserves a rich biological and geological diversity. Visitors are able to enjoy recreational opportunities that foster a better understanding and appreciation of the area's natural and human history.

Mission Statement

The mission statement is based on the national memorial's purpose and significance. It includes future conditions or visions, stated as outcomes, and articulates the ideals that the National Park Service is striving to obtain for Coronado National Memorial. This qualitative statement is expressed in terms of resource conditions and appropriate visitor experiences. The memorial's mission goals are consistent with the mission goals found in the

National Park Service's *Strategic Plan*. Thus, they support the overall mission of the agency.

The Coronado National Memorial mission is to commemorate and interpret the significance of Francisco Vásquez de Coronado's expedition and the resulting cultural influences of 16th century Spanish colonial exploration in the Americas. The memorial preserves and interprets the natural and human history of the area for the benefit and enjoyment of current present and future generations.

Primary Interpretive Themes

Interpretive themes are ideas, concepts, or stories that are central to the memorial's purpose, identity, and visitor experience. Primary themes provide the framework for Coronado National Memorial's interpretation and educational programs, influence the desired visitor experience, and provide direction for planners and designers who develop the memorial's exhibits, publications, and audio-visual programs. The draft primary themes are detailed below. Subthemes may be added during subsequent interpretive planning.

As a context for the memorial's interpretive themes, it should be noted that the Spanish discovery and eventual settlement of what is now the southwestern United States occurred much earlier than European settlement of what is now the eastern United States. The earlier conquest of Mexico and Peru fueled a race to the unknown northern lands by Spanish explorers Coronado, DeSoto, and Cabrillo. The Spanish conquest, although controversial, is a fascinating story of how a small force, with the aid of technology, was able to lay the groundwork for Spain's control of a vast empire. The memorial's interpretive themes are as follows:

- The Coronado Expedition (1540–1542), the first major exploration of the Southwest by Europeans, was an incredible feat that made known the vast extent of the land and culture north of central Mexico.

- The expedition, intended to win converts to Catholicism, find gold, and claim land, had and continues to have a major impact in shaping the history, social and political culture, and environment of the southwestern United States and Mexico.
- Coronado National Memorial preserves and interprets a rich biological and geological diversity typical of the Sky Island bioregion.
- The unique natural features and panoramic views of the area remain similar to the actual time of the expedition and provide an excellent opportunity for contemplating the thoughts, motives, and hardships of the members of the Coronado Expedition and its impacts on native populations, their cultures, and the environment.

CONSTRAINTS, ISSUES, AND CONCERNS

During the planning process, the planning team identified a variety of issues that the National Park Service may face in the future. The plan will provide a framework or strategy for addressing those issues within the context of the memorial's purpose, significance, and mission. The following issues were identified and refined through discussions with national memorial staff, interested agencies and organizations, and the general public.

International Significance

The memorial's southern boundary is on the border between the United States and Mexico. How can the memorial best commemorate the relationship between the United States and Mexico?

Protection of Resources and the Visitor Experience

The memorial's location on the U.S.–Mexico border has resulted in an illegal trafficking in

drugs and people, which adversely affects both resources and the visitor experience. How can the experience of visitors to the memorial best be safely maintained and enhanced?

Views

The memorial contains superlative views of the San Pedro River Valley in the United States and Mexico, and these views represent an important part of the visitor experience. To carry out the memorial's purpose, the surrounding landscape is important. Various modern encroachments are gradually intruding on this landscape. How best can the National Park Service preserve the landscape at the memorial's boundaries and beyond?

Interpretation

The memorial's mission is to commemorate and interpret the first major exploration by Europeans into the American Southwest and the events associated with that milestone. What is the interpretive role of the National Park Service? What stories should be told and how can they best be conveyed?

Orientation

It is difficult for visitors to gain a full understanding of the memorial and its geographical context. Highways to the memorial are poorly marked and lack clear direction. Some visitors do not understand the distinction between the memorial and the surrounding national forest. How can the lack of awareness of the memorial within the regional setting be addressed?

Development

The visitor center, headquarters building, maintenance facilities, and staff housing are inadequate. NPS managers must determine what facilities are necessary for future visitor experiences and resource protection needs. Efficiency and sustainability are prime

considerations, as is providing a setting that promotes visitor understanding. (*Sustainability* refers to results attained by managing an area in ways that do not compromise the environment or its capacity to provide for present and future generations. Sustainable practices minimize the environmental effects of developments and other activities by conserving resources, minimizing waste, recycling, and using energy-efficient, ecologically responsible materials and techniques.)

Livestock Management

Two areas in the memorial are leased out as grazing allotments. A concern has been raised about conflicts between the NPS mission and the potential detrimental effect of grazing on recreation and resources. NPS managers must determine the role of grazing while providing for visitor understanding and resource protection.

PARTNERSHIPS

Public involvement is required to maximize the services offered to visitors and to counteract the effect of overextended NPS funding and staff. A strategy must be developed to encourage public and private groups to assist in the mission of Coronado National Memorial.

RELATIONSHIP TO OTHER PLANNING EFFORTS

Possible conflicts between the alternatives and county, state, or tribal or federal land use plans and policies must be considered. Coronado National Memorial is adjacent to the U.S. border with Mexico. Coronado National Forest is adjacent to the memorial on its northern and western boundaries. There is a single state parcel on the southeastern boundary of the memorial. The remaining surrounding land is primarily privately owned

residential and agricultural lands with a few commercial parcels.

About 10 miles east of the memorial, the San Pedro Riparian National Conservation Area, administered by the Bureau of Land Management, extends along the river corridor from the Mexican border to several miles south of Saint David. This area was set aside to protect and enhance the riparian ecosystem and related resources. Birds nest in the San Pedro and use it as a migratory pathway. A variety of grassland and riparian species can be seen in this area. North of the memorial is the community of Fort Huachuca. Coronado National Forest is adjacent to the memorial on the north. Together, Coronado National Forest and Fort Huachuca cover 73,000 acres. There are no tribal lands nearby.

The U.S. Forest Service is constructing a trail system along the eastern side of the Huachuca Mountains that may eventually connect to the memorial boundary near its northeast corner.

The National Park Service is participating as a cooperating agency in an environmental assessment about a proposal to place a remote video surveillance camera in Coronado National Memorial. Other agencies involved are the United States Border Patrol, Immigration and Naturalization Service, U.S. Department of Justice. In addition, the National Park Service will have an opportunity to comment on an environmental assessment about a proposal to install vehicle barriers along part of the memorial's boundary (which is also the international border). The National Park Service will request funding from Congress for vehicle barriers.

The U.S. Border Patrol has begun the scoping process for a proposal for other improvements, including an improved border road and a 300-foot security zone along the U.S.-Mexico border. All the planning and compliance efforts for the Border Patrol projects involve lands inside and outside Coronado National Memorial.

Changes brought about by any of the alternatives would not conflict with any of the approved plans of other jurisdictions. (For more details, see “Cumulative Effects,” p. 115.)

SPECIAL PARK MANDATES AND ADMINISTRATIVE COMMITMENTS

Coronado National Memorial, created from U.S. Forest Service lands, was authorized in 1941 and established in 1952. The 1941 legislation provided for the continuation of grazing within the memorial boundaries “provided it does not interfere with recreational development.”

The National Park Service in 2000 published the *Livestock Management Plan, Including Livestock Management Guidelines, Environmental Assessment* (NPS 2000b) and allotment treatment plans. Among other provisions, it calls for the National Park Service to work toward permanently retiring the remaining grazing allotments as opportunities arise to do so through mutual agreement with the permittees. Until this can be accomplished, the *Livestock Management Plan* will serve to moderate the effects of grazing. Some alternatives of this *General Management Plan* could result in retiring one or both of the grazing allotments.

SERVICEWIDE LAWS AND POLICIES

As with all units of the national park system, the management of Coronado National Memorial is guided by the 1916 Organic Act that created the National Park Service, the General Authorities Act of 1970, the act of March 27, 1978 (relating to the management of the national park system), and other applicable federal laws and regulations such as the Endangered Species Act and the National Historic Preservation Act. Actions also are guided by *NPS Management Policies 2001*.

Many resource conditions and some aspects of the visitor experience are prescribed by these legal mandates and NPS policies. The management plan is not needed to decide, for instance, whether or not it is appropriate to protect endangered species, control exotic species, improve water quality, protect archeological sites, provide access for visitors with disabilities, or conserve artifacts. Although attaining some of these conditions has been deferred in the memorial because of funding or staffing limitations, the National Park Service will continue to strive to implement these requirements with or without a new general management plan.

The conditions prescribed by the laws, regulations, and policies most pertinent to the planning and management of the memorial are summarized in the following charts.

BACKGROUND

Natural Resource Management Requirements

Air Quality	
Desired Condition	Source
Air quality in the memorial, a class II air quality area, meets national ambient air quality standards (NAAQS) for specified pollutants.	Clean Air Act, <i>NPS Management Policies 2001</i>
Memorial activities do not contribute to deterioration in air quality. Healthful indoor air quality is ensured in NPS facilities.	Clean Air Act, <i>NPS Management Policies 2001</i>
Compliance Actions	
<p>Although the National Park Service has very little direct control over air quality within the airshed encompassing the region, memorial managers cooperate with the Arizona Department of Environmental Quality and the Environmental Protection Agency to monitor air quality and ensure that air quality is not degraded. In addition, the National Park Service will take the following actions to meet legal and policy requirements related to air quality:</p> <ul style="list-style-type: none"> Participate in regional air pollution control plans and regulations and review of permit applications for major new air pollution sources. Conduct memorial operations in compliance with federal, state, and local air quality regulations. 	

Water Quality	
Desired Condition	Source
Surface water and groundwater are restored or enhanced.	Clean Water Act; Executive Order (EO) 11514; <i>NPS Management Policies 2001</i>
NPS and NPS- permitted programs and facilities are maintained and operated to avoid pollution of surface water and groundwater.	Clean Water Act; EO 12088; <i>NPS Management Policies 2001</i>
Compliance Actions	
<p>The National Park Service will take the following actions:</p> <ul style="list-style-type: none"> Apply best management practices to all pollution- generating activities and facilities in the memorial, such as NPS maintenance and storage facilities and parking areas; minimize use of pesticides, fertilizers, and other chemicals, and manage them in keeping with NPS policy and federal regulations. 	

Natural Resource Management Requirements (continued)

Species of Special Concern	
Desired Condition	Source
Populations of native plant and animal species function in as natural condition as possible except where special management considerations are warranted.	Endangered Species Act; NPS Management Policies 2001
Native species populations that have been severely reduced in or extirpated from the memorial are restored where feasible and sustainable.	NPS Management Policies 2001
Management of populations of exotic plant and animal species, up to and including eradication, will be undertaken wherever such species threaten memorial resources or public health and when control is prudent and feasible.	NPS Management Policies 2001; EO 13112, Invasive Species.
Compliance Actions	
<p>Several species of invasive exotic plants have become established in disturbed areas in the memorial and represent a threat to native species. Given time, these aggressive exotic plants can greatly expand their populations, alter forest and wildlife habitats, and change memorial scenery by smothering and displacing native species. These effects, already clearly occurring in some areas of Coronado National Memorial, will worsen substantially if left untreated. A sustained effort is needed to control these internal threats to the native species and their natural habitats. The National Park Service will take the following actions to comply with legal and policy requirements related to native species and to manage the national memorial "in as natural condition as possible."</p> <ul style="list-style-type: none"> ▪ Complete an inventory of plants and animals in the memorial and regularly monitor the distribution and condition (health or disease) of selected species that are (a) indicators of ecosystem condition and diversity, (b) rare or protected species, (c) invasive exotics, or (d) native species capable of creating resource problems (such as habitat decline due to overpopulation). ▪ Support research that will contribute to knowledge for the management of native species. ▪ Take mitigating actions to restore native species and their habitats where warranted. ▪ Control or eliminate exotic plants where there is a reasonable expectation of success and sustainability. ▪ Obtain a systematic survey of rare plants and animals to improve management. Particularly, inventory and monitor threatened or endangered species, improve habitat for and the protection of endangered bats and Mexican spotted owls, and assess the barking frog population. 	

Wildland Fire	
Desired Condition	Source
Fire management programs in the memorial will be designed to meet resource management objectives prescribed for various areas of the memorial and to ensure that firefighter and public safety are not compromised. Until a fire management plan is approved, all wildland fires must be aggressively suppressed, taking into account resources to be protected and firefighter and public safety.	NPS Management Policies 2001; DO 41, Wilderness Preservation and Management
Compliance Actions	
<p>All fires burning in natural or landscaped vegetation in Coronado National Memorial will be classified as either wildland fires or prescribed fires. All wildland fires will be effectively managed, considering resource values to be protected and the safety of firefighters and the public, using the full range of strategic and tactical operations as described in an approved fire management plan. Prescribed fires are fires ignited by managers to achieve resource objectives. For prescribed fires, actions will include monitoring programs that record fire behavior, smoke behavior, fire decisions and fire effects to provide information on whether specified objectives are met. The memorial intends to begin drafting a fire management plan in FY 04, which should be completed during FY 05.</p>	

Natural Resource Management Requirements (continued)

Night Sky [referred to as Lightscape Management in <i>NPS Management Policies 2001</i>]	
Desired Condition	Source
The National Park Service will cooperate with neighbors and local government agencies in seeking to minimize the intrusion of artificial light into the night scene in the national memorial. In natural areas, artificial outdoor lighting will be limited to basic safety requirements and will be shielded when possible.	<i>NPS Management Policies 2001</i>
Compliance Actions	
<p>The National Park Service will take the following actions to comply with legal and policy requirements related to the night sky.</p> <ul style="list-style-type: none"> ▪ Work with local communities and other agencies to encourage the protection of the night sky. ▪ Evaluate impacts on the night sky caused by facilities in the memorial. If light sources in the memorial are found to affect night skies, memorial staff will study alternatives such as shielding lights, changing lamp types, or eliminating unnecessary sources. 	

Natural Sounds [referred to as Soundscape Management in <i>NPS Management Policies 2001</i>]	
Desired Condition	Source
An important part of the NPS mission is to preserve or restore the natural soundscapes associated with units of the national park system, including Coronado National Memorial. The sounds of nature are among the intrinsic elements that combine to form the environment of our national memorial. The National Park Service will preserve the natural ambient soundscapes, restore degraded soundscapes to the natural ambient condition wherever possible, and protect natural soundscapes from degradation due to human- caused noise. Disruptions from recreational uses will be managed to provide a high- quality visitor experience, striving to preserve or restore the natural quiet and sounds.	<i>NPS Management Policies 2001</i> ; DO 47, <i>Sound Preservation and Noise Management</i>
The Federal Aviation Administration and the National Park Service were directed to “develop appropriate educational and other materials for the public at large and all aviation interests that describe the importance of natural quiet to memorial visitors and the need for cooperation from the aviation community.”	Executive memorandum signed by President Clinton on April 22, 1996
Compliance Actions	
<p>The National Park Service will take the following actions to comply with this policy:</p> <ul style="list-style-type: none"> ▪ Take actions to prevent or minimize unnatural sounds that adversely affect the memorial’s resources or values or visitors’ enjoyment of them. ▪ The National Park Service will work with the Federal Aviation Administration (FAA) and the Department of Defense (DOD), tour operators, commercial businesses, and general aviation interests to encourage aircraft to fly outside the national memorial, especially for flights where the presence of the memorial is incidental to the purpose of the flight (such as when the flight is simply a transit between two points). Actions that may be considered to encourage pilots to fly outside the memorial include identifying the memorial on route maps as a noise- sensitive area, educating pilots about the reasons for keeping a distance from the memorial, and encouraging pilots to fly in compliance with FAA regulations and advisory guidance in a manner that minimizes noise and other impacts. ▪ The staff of Coronado National Memorial will continue to require tour bus companies to comply with regulations that reduce noise levels (such as turning off engines when buses are parked). ▪ Minimize noise generated by NPS management activities by strictly regulating administrative functions such as the use of motorized equipment. Noise will be a consideration in the procurement and use of equipment by the memorial staff. 	

Cultural Resource Management Requirements

Archeological Resources	
Current laws and policies require that the following conditions be achieved in units of the national park system, including Coronado National Memorial:	
Desired Condition	Source
Archeological sites are identified and inventoried, and their significance is determined and documented. Archeological sites are protected in an undisturbed condition unless it is determined through formal processes that disturbance or natural deterioration is unavoidable. In cases where disturbance or deterioration is unavoidable, the site is professionally documented and salvaged in consultation with the Arizona state historic preservation officer and affiliated American Indian tribes.	National Historic Preservation Act; EO 11593; Archeological Resources Protection Act; <i>The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i> ; Programmatic Memorandum of Agreement Among the NPS, Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (1995); <i>NPS Management Policies 2001</i> ; DO 28 <i>Cultural Resources Management Guidelines</i> ; List of Classified Structures; Cultural Landscape Inventory
Compliance Actions	
<p>Archeological surveys of the entire national memorial have been completed. Of a total of 15 archeological sites listed for the memorial, the condition of 8 was reevaluated in 2001. With further review of the original data and the assistance of the archeologist in the Southern Arizona Group office, conditions will be determined for as many of the remaining 7 sites as possible, and a work plan and budget will be prepared to acquire other data as needed.</p> <p>The National Park Service will take the following actions to meet legal and policy requirements related to archeological sites:</p> <ul style="list-style-type: none"> ▪ Treat all archeological resources as eligible for listing on the National Register of Historic Places pending a formal determination of their significance by the National Park Service and the Arizona state historic preservation office. ▪ Protect all archeological resources eligible for listing or listed on the national register; if disturbance to such resources is unavoidable, conduct formal consultation with the Advisory Council on Historic Preservation, as appropriate, and with the Arizona state historic preservation office in accordance with the National Historic Preservation Act and implementing regulations. 	

Cultural Resource Management Requirements (continued)

Historic Properties	
Current laws and policies require that the following conditions be achieved in units of the national park system, including Coronado National Memorial, for historic properties (such as buildings, structures, roads, trails, and cultural landscapes):	
Desired Condition	Source
Historic resources are inventoried and their significance and integrity are evaluated under the criteria for the National Register of Historic Places. The qualities that contribute to the eligibility for listing or listing of historic properties on the national register are protected in accordance with the <i>Secretary of the Interior's Standards</i> unless it is determined through a formal process that disturbance or natural deterioration is unavoidable.	National Historic Preservation Act; EO 11593; Archeological and Historic Preservation Act; the <i>Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i> ; Programmatic memorandum of agreement among the NPS, the Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (1995); <i>NPS Management Policies 2001</i> , DO 28, <i>Cultural Resources Management Guidelines</i> (1994); the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties, with Guidelines for the Treatment of Cultural Landscapes</i> ; <i>List of Classified Structures</i> ; <i>Cultural Landscape Inventory</i>
Compliance Actions	
The National Park Service will take the following actions to meet legal and policy requirements related to historic resources:	
<ul style="list-style-type: none"> ▪ Determine the appropriate level of preservation for each historic property formally determined to be eligible for listing or listed on the National Register of Historic Places (subject to the <i>Secretary of the Interior's Standards</i>).* ▪ Implement and maintain the appropriate level of preservation for such properties. ▪ Analyze the design elements (materials, colors, shape, massing, scale, architectural details, site details) of historic structures and cultural landscapes in the national memorial (such as buildings, bridges, trails, roads and intersections, curbing, signs, picnic tables) to guide the rehabilitation and maintenance of sites and structures.* ▪ Before modifying any historic properties on the national register, such as structures built by the Civilian Conservation Corps (CCC) along the main road, the National Park Service will consult with the Arizona state historic preservation office and the Advisory Council for Historic Preservation, as appropriate. 	
<p>For other actions, see "Future Plans and Studies Needed," page 68.</p> <p>*Before undertaking any restoration of natural contours or any revegetation, the National Park Service will evaluate all human-made features such as buildings or other structures, roads, or trails to determine their eligibility for the national register, and if any are found eligible, consult with the Arizona state historic preservation office to develop a plan for treatment of these features.</p>	

Cultural Resource Management Requirements (continued)

Ethnographic Resources	
Certain contemporary American Indian and other communities are permitted by law, regulation, or policy to pursue customary religious, subsistence, and other cultural uses of national memorial resources with which they are traditionally associated. Recognizing that its resource protection mandate affects this human use and cultural context of resources, the National Park Service plans and executes programs in ways that safeguard cultural and natural resources while reflecting informed concern for the contemporary peoples and cultures traditionally associated with them.	
Desired Condition	Source
Appropriate cultural anthropological research is conducted in cooperation with groups associated with Coronado National Memorial.	National Historic Preservation Act; Advisory Council for Historic Preservation implementing regulations; <i>NPS Management Policies 2001</i> ; DO 28, <i>Cultural Resources Management Guidelines</i> .
The National Park Service will accommodate access to and ceremonial use of American Indian sacred sites by American Indian religious practitioners and avoid adversely affecting the physical integrity of these sacred sites.	EO 13007 on American Indian sacred sites; American Indian Religious Freedom Act
NPS general regulations on access to and the use of natural and cultural resources in units of the national park system will be applied in an informed and balanced manner that is consistent with the national memorial's purposes, does not unreasonably interfere with American Indian use of traditional areas or sacred resources, and does not result in the degradation of national memorial resources.	EO 13007 on American Indian Sacred Sites; American Indian Religious Freedom Act; <i>NPS Management Policies 2001</i>
Other federal agencies, state and local governments, potentially affected American Indians, and other communities, interested groups, the Arizona state historic preservation officer, and the Advisory Council on Historic Preservation will be given opportunities to become informed about and comment on anticipated NPS actions at the earliest practicable time.	National Historic Preservation Act; Programmatic memorandum of agreement among the NPS, the Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (1995); EO 11593; American Indian Religious Freedom Act; Native American Graves Protection and Repatriation Act; EO 13007 on American Indian sacred sites, Presidential Memorandum of April 29, 1994, on "Government to Government Relations with Tribal Governments"; <i>NPS Management Policies 2001</i>
All agencies consult with tribal governments before taking actions that affect federally recognized tribal governments. These consultations are open and candid so that all interested parties may evaluate for themselves the potential impact of relevant proposals. The national memorial regularly consults with traditionally associated Native Americans regarding planning, management, and operational decisions that affect subsistence activities, sacred materials or places, or other ethnographic resources with which they are historically associated.	American Indian Religious Freedom Act; Presidential Memorandum of April 29, 1994 on Government to Government Relations with Tribal Governments; National Historic Preservation Act; Implementing regulations of the Advisory Council for Historic Preservation.
The identities of community consultants and information about sacred and other culturally sensitive places and practices will be kept confidential when research agreements or other circumstances warrant.	National Historic Preservation Act; <i>NPS Management Policies 2001</i>
American Indians and other individuals and groups linked by ties of kinship or culture to ethnically identifiable human remains, sacred objects, objects of cultural patrimony, and associated funerary objects will be consulted when such items may be disturbed or are encountered on national memorial lands.	<i>NPS Management Policies 2001</i> ; Native American Grave Protection and Repatriation Act
(continued on next page)	

Cultural Resource Management Requirements (continued)

Ethnographic Resources (continued)	
Compliance Actions	
<p>The National Park Service will take the following actions to meet legal and policy requirements related to ethnographic resources:</p> <ul style="list-style-type: none"> ▪ Continue to provide access to sacred sites and national memorial resources by American Indians that is consistent with the purposes of Coronado National Memorial and the protection of the memorial's resources. ▪ Survey and inventory ethnographic resources and document their significance. ▪ Treat all ethnographic resources as eligible for listing on the National Register of Historic Places pending a formal determination of their significance by the National Park Service and the Arizona state historic preservation officer. ▪ Protect all ethnographic resources determined eligible for listing or listed on the national register. If disturbance to such resources is unavoidable, conduct formal consultation with Advisory Council on Historic Preservation, as appropriate, the Arizona state historic preservation office, and American Indian tribes in accordance with the National Historic Preservation Act and the ACHP implementing regulations and programmatic agreement. ▪ Conduct regular consultations with affiliated tribes to continue to improve communications and resolve any problems or misunderstandings that occur. ▪ Continue to encourage the employment of American Indians on the national memorial staff so as to improve communications and working relationships and encourage cultural diversity in the workplace. 	
<p>For other actions, see "Future Plans and Studies Needed, page 68.</p>	

Museum Collections	
Current laws and policies require that the following conditions be achieved in the national memorial for museum collections:	
Desired Condition	Source
All museum objects and manuscripts are identified and inventoried, and their significance is determined and documented. The qualities that contribute to the significance of collections are protected in accordance with established standards.	National Historic Preservation Act; American Religious Freedom Act; Archeological and Historic Preservation Act; Archeological Resources Protection Act; Native American Graves Protection and Repatriation Act; NPS <i>Management Policies 2001</i> ; DO 28, <i>Cultural Resources Management Guidelines</i>
Compliance Actions	
<p>The National Park Service will take the following actions to meet legal and policy requirements related to collections:</p> <ul style="list-style-type: none"> ▪ Inventory and catalog all the national memorial's museum collections in accordance with standards in the NPS Museum Handbook. ▪ Develop and implement a collection management program according to NPS standards to guide the protection, conservation, and use of museum objects. 	

Requirements for Sustainable Design and Development

Sustainable Design and Development	
Desired Condition	Source
NPS and concessioner visitor facilities will be harmonious with national memorial resources, compatible with natural processes, aesthetically pleasing, functional, as accessible as possible to all segments of the population, energy- efficient, and cost- effective.	NPS <i>Management Policies 2001</i> ; EO 13123, <i>Greening the Government through Efficient Energy Management</i> ; EO 13101, <i>Greening the Government through Waste Prevention, Recycling, and Federal Acquisition</i> ; NPS <i>Guiding Principles of Sustainable Design</i> ; DO 13, <i>Environmental Leadership</i> ; DO 90, <i>Value Analysis</i> .
Compliance Actions	
To achieve sustainability and reduce costs, eliminate waste, and conserve resources, the National Park Service will observe established sustainability principles, emphasizing the use of renewable energy, and will also do the following:	
<ul style="list-style-type: none"> Coronado National Memorial staff will work with appropriate experts to make the memorial's facilities and programs sustainable. Value analysis and value engineering, including life cycle cost analysis, will be preformed to examine the energy, environmental, and economic implications of proposed developments. The national memorial's staff will support and encourage suppliers, permittees, and contractors to follow sustainable practices. Interpretive programs will address sustainable practices by the national memorial and others. 	

Requirements for Visitor Experience and Use of the National Memorial

Visitor Experience	
Desired Condition	Source
Visitor and employee safety and health are protected.	NPS <i>Management Policies 2001</i>
Visitors understand and appreciate the national memorial's values and resources and have the information necessary to adapt to the memorial's environments; they have opportunities to enjoy the memorial in ways that leave the resources unimpaired for future generations.	NPS Organic Act; NPS <i>Management Policies 2001</i> ; DO 22, <i>Fee Collection</i>
Recreational uses in the memorial are promoted and regulated, and basic visitor needs are met in keeping with the purposes of Coronado National Memorial.	NPS Organic Act; Title 36 of the Code of Federal Regulations (CFR 36); NPS <i>Management Policies 2001</i>
To the extent feasible, facilities, programs, and services in the national memorial are accessible to and usable by all people, including those with disabilities.	Americans with Disabilities Act; Architectural Barriers Act; Rehabilitation Act; NPS <i>Management Policies 2001</i>
Visitors who use federal facilities and services for outdoor recreation may be required to pay a greater share of the cost of providing those opportunities than the population as a whole.	NPS <i>Management Policies 2001</i> ; 1998 Executive Summary to Congress; Recreational Fee Demonstration Program, Progress Report to Congress: Vol. I, Overview and Summary (USDI, NPS, USFWS, BLM; USDA, USFS)
The Coronado National Memorial staff has identified implementation commitments for visitor carrying capacities for all areas of the national memorial.	1978 National Parks and Recreation Act (PL 95- 625), NPS <i>Management Policies 2001</i>
Compliance Actions	
These laws, regulations, and policies leave considerable room for judgment about the best mix of types and levels of visitor activities, programs, and facilities. Therefore, most decisions related to visitor understanding and use are addressed in the alternatives. The National Park Service will take the following kinds of actions to meet legal and policy requirements related to visitor experience and visitors' use of the national memorial:	
<ul style="list-style-type: none"> Provide opportunities for visitors to understand, appreciate, and enjoy Coronado National Memorial (management directions are explored in the alternatives within this broad policy). Continue to enforce the regulations governing visitor use and behavior in 36 CFR. Ensure that all programs and facilities of the national memorial are accessible to the extent feasible. After the approval of the <i>Final General Management Plan</i>, undertake detailed planning to establish visitor carrying capacity strategies and monitoring programs. 	

Requirements for Right- of- Way and Telecommunication Infrastructure

Right- of- Way and Telecommunication Infrastructure	
Desired Condition	Source
The resources of Coronado National Memorial or the public's enjoyment of the national memorial are not denigrated by nonconforming uses. Telecommunication structures are permitted in the memorial to the extent that they do not jeopardize its mission and resources. No new nonconforming use or rights- of- way will be permitted through the national memorial without specific statutory authority and approval by the director of the National Park Service or his representative, and such uses will be permitted only if there is no practicable alternative to such use of NPS lands.	Telecommunications Act; 16 USC 79; 23 USC 317; 36 CFR 14; NPS <i>Management Policies 2001</i> ; DO 53A, <i>Wireless Telecommunications</i> ; Reference Manual 53, <i>Special Park Uses</i>
Compliance Actions	
<p>The National Park Service will take the following kinds of actions to meet legal and policy requirements related to rights- of- way and the telecommunication infrastructure:</p> <ul style="list-style-type: none"> ▪ According to the Telecommunications Act of 1996, accommodate requests of telecommunication companies for the use of property, rights- of- way, and easements to the extent allowable under the NPS mission. ▪ The enabling legislation for Coronado National Memorial emphasizes the need for protecting the views of the Coronado Expedition's route along the San Pedro river as the primary mission of the memorial. Any use of the memorial's lands for telecommunication infrastructures could occur <i>only</i> if this use would not affect the memorial's ability to accomplish its mission of preserving those historic views. 	

IMPACT TOPICS

Impact topics are used to focus discussion, assess the potential environmental consequences of each alternative, and compare the alternatives' consequences. Impact topics were selected for analysis by determining which resources or elements of the human environment would be affected by the actions of each alternative.

Impact topics were identified on the basis of federal laws, regulations, and executive orders (such as the National Environmental Policy Act and NPS *Management Policies 2001*) and such sources as federal legislation, executive orders, and the regulations of the Council on Environmental Quality (CEQ) for implementing the National Environmental Policy Act (CEQ 1978). Other topics that must be considered are listed in *Director's Order #12 and Handbook* (NPS 2001b). Also useful in identifying impact topics was NPS knowledge of limited or easily affected resources.

Other impact topics were identified on the basis of regional or memorial-specific concerns, or as a result of scoping. (*Scoping* is seeking public interest, concerns, and ideas about the management of a unit of the national park system.) A brief rationale for the selection of each impact topic is given below.

Natural Resources

The planning team selected several natural resource impact topics. The selection was based on the major values or issues the team identified early in the planning process, as well as on applicable laws and executive orders (see appendix B). Natural resource topics are air quality; cave resources; soils; vegetation; threatened, endangered, or sensitive species; water quality; and wildlife.

Cultural Resources

Cultural resource impact topics were selected on the basis of major values identified in the

memorial's enabling legislation, values identified in the scoping process, and applicable laws and executive orders pertaining to cultural resources (the 1966 National Historic Preservation Act and the National Environmental Policy Act). The topics are archeological resources, historic structures, ethnographic resources, and cultural landscapes.

Visitor Understanding and Recreational Resources

The planning team identified visitor understanding as an important issue that could be appreciably affected by the implementation of the alternatives. Impact topics in this category are visitor access to the memorial's resources, visitor access to orientation and interpretive information, and visitors' experience of the resources.

The Socioeconomic Environment

The planning team selected three impact topics related to the socioeconomic environment. The selection was based on the major values or issues that the team identified early in the planning process, as well as on applicable laws and executive orders. The topics identified were recreational use of Coronado National Memorial, grazing, and the local and regional economy.

IMPACT TOPICS DISMISSED FROM FURTHER CONSIDERATION

Resources and environmental concerns that either would not be affected or would be negligibly affected by the alternative actions were eliminated from further consideration and comparative analysis. Other topics were dismissed because they were not identified as concerns by regulators, the public, or other stakeholders during scoping. Impact topics that were dismissed from further consideration are outlined below, as are the justifications for each dismissal.

Natural Resource Topics

Water Quantity. The Upper San Pedro Partnership is “a consortium of agencies and organizations formed in 1998 to facilitate and implement sound water resource management and conservation strategies in the Sierra Vista Sub- Watershed of the San Pedro River.” The partnership’s purpose is to “coordinate and cooperate” in identifying, assigning priorities, and implementing comprehensive policies and projects to help meet water needs in the Sierra Vista subwatershed.

The partnership has established as its highest priority the development of an Upper San Pedro conservation plan, with a goal of ensuring that an adequate long- term ground- water supply will be available to meet the reasonable needs of current and future area residents and property owners, as well as the needs of the San Pedro Riparian National Conservation Area. Coronado National Memorial is in the Sierra Vista sub- watershed and is a member of the San Pedro Partnership. The National Park Service will continue to work with the partnership to meet its stated priorities, as follows:

- developing an Upper San Pedro conservation plan
- supporting and assisting member agencies in continuing the implementation of their existing plans, including efforts to reduce consumption, reuse/recharge effluent, and recharge stormwater
- supporting the collection and analysis of scientific data that will improve the ability to make informed decisions on the best projects and policies to accomplish the partnership’s planning goal

Regardless of the management alternative chosen, there would be little effect on the hydrology or quality of the memorial’s water resources, largely because water is an extremely limited resource in the memorial. Practices are already in place to optimize water use, protect water quality, and maximize

the conservation and reuse of water. For example:

- The well that the national memorial uses is at or near capacity. Regardless of the alternative selected, a study will be required to determine if additional conservation measures can adequately meet the memorial’s slowly growing water needs or whether another solution such as an additional well is needed.
- The memorial’s wastewater is treated by a leachfield, from which it percolates into the ground to recharge the groundwater. This practice would continue, regardless of which alternative was selected.

The National Park Service has requested a federally reserved water right of 10 acre- feet per year. This request is being considered as part of the current Upper San Pedro River Basin adjudication process. If granted, adjudication would legally give the memorial the right to use 10 acre- feet per year (1 acre foot = 326,000 gallons) from any combination of state and federal water sources located on the memorial’s lands. This quantity of water would be sufficient for current activities and would allow for development over the next 50 years. Once a federal reserve water right has been established, it is unlikely that additional water resources would be made available to the memorial without a new adjudication request (NPS Water Resources Division, W. Hanson, pers. comm. 2002).

State- Listed Wildlife of Special Concern.

Wildlife of special concern are identified as species whose occurrence in Arizona is or may be in jeopardy, or with known or perceived threats or population declines, as described by the Arizona Game and Fish Department (AZ G&F Dept. 1996). The barking frog (*Eleutherodactylus augusti*) is considered a species of concern because of its limited distribution and threats to its habitat from road expansion and the development of recreation and administrative sites.

The presence of barking frogs at Coronado National Memorial was confirmed in 1993 (USGS and U. of AZ 1997). They inhabit rocky limestone areas of the memorial, some of which are in the Joe's Spring grazing allotment. In recent surveys, barking frogs also were heard in other locations in the Huachuca Mountains (NPS 2001b). The results of the recent surveys indicate that the number of known locations of calling male frogs has increased since the surveys of the early 1990s.

The Arizona Game and Fish Department considers the elegant trogon (*Trogon elegans*) a special concern species. These brightly colored solitary forest birds are quiet when perched, flutter in the air to pick small fruit, and also consume insects. They live in high-elevation pine and pine-oak forests, sometimes with madrone and Arizona sycamore riparian woodland, in the southwestern United States. They are migrants in the mountain ranges of southeastern Arizona (Kunzmann, Hall, and Johnson 1998). Elegant Trogons often nest in abandoned woodpecker cavities in trees. They breed from the mountains of southern Arizona (rare or irregular in the Huachuclas, Santa Ritas, and Chiricahuas) to Costa Rica (Peterson 1961). They have been sighted in the memorial over the years between May and November; however, their occurrence can be considered rare (SW Parks and Monuments Assn. 1993).

These species are not federally listed as endangered or threatened, and they are not candidates for listing. Therefore, they do not have any protections beyond those afforded to other species of wildlife and birds, and they were not considered in detail in the evaluation of the effects of the alternatives. The actions of the alternatives would not be likely to occur in areas suitable for barking frog habitat. The elegant trogon may pass through the national memorial, but it is considered a transient. Construction activities and noise that would occur under some alternatives might disturb the elegant trogon or preclude it from foraging in construction areas; however, the

actions would not permanently displace this species from the memorial.

Despite the lack of federal listing, it is NPS policy to protect state-listed and candidate species. Therefore, during the implementation of this plan, site-specific surveys would be conducted before any disturbance could take place in habitat suitable for either the barking frog or the elegant trogon. If either species was found, the proposed action would be relocated, or other mitigation would be arranged to prevent adverse effects on individuals or their habitat.

Prime or Unique Agricultural Lands. According to the Natural Resources Conservation Service, U.S. Department of Agriculture, (K. Maguire, pers. comm. 2001), none of the soil types occurring in the memorial is prime or unique agricultural soil. Prime farmland has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Unique land is land other than prime farmland that is used for the production of specific high-value food and fiber crops. Both categories require that the land be available for farming uses. The lands in Coronado National Memorial are not available for farming and therefore do not meet the criteria for prime or unique agricultural lands.

Ecologically Critical Areas. Coronado National Memorial does not contain any designated ecologically critical areas, wild and scenic rivers, or other unique natural resources, as referred to in 40 CFR 1508.27.

Wetlands. Wetlands that would meet the Clean Water Act criteria as jurisdictional wetlands do not occur within the area affected by actions associated with the alternatives. Therefore, this impact topic was eliminated from further consideration. The areas affected by the alternatives do consist of riparian vegetation composed of western honey mesquite-mixed short tree woodland association (PMT) and Arizona sycamore-Arizona walnut-oak riparian forest association (PJQ). The effects

of management activities on riparian vegetation have been analyzed under the vegetation impact topic.

Wilderness. There is no designated wilderness area within Coronado National Memorial. It has been determined that no areas of the memorial are suitable for wilderness designation (see appendix C).

Floodplains. Federal agencies are directed by EO 11988, *Floodplain Management* to reduce the risk of flood loss, minimize the impact of floods on human safety, and evaluate the potential effects of any actions taken in a floodplain. In addition, this executive order requires that federal structures and facilities be constructed in accordance with the standards of the National Flood Insurance Program.

The national memorial does not lie within a designated floodplain, and Federal Emergency Management Agency maps indicate that no analysis of flood hazards has been conducted in or around Coronado National Memorial. Occasional intense summer thunderstorms contribute to the possibility of flash flooding in the memorial. High water in ephemeral streams and dry arroyos could occur periodically; these events would be transient and highly variable. The occurrence rate or severity of these flash floods could not be affected by any of the alternatives, and none of the actions of the alternatives would increase the potential for downstream flooding or amplify the flood hazard. Therefore, floodplains are not evaluated in this document.

Lightscape/Night Sky. Parks are required by NPS *Management Policies 2001* to “preserve to the greatest extent possible the natural lightscapes of parks, which are natural resources and values that exist in the absence of human- caused light.” The agency is developing the Night Sky Initiative to formulate a policy for protecting views of the stars and planets in our national parks. To meet this directive, the use of lighting would

be restricted to areas where security and safety are required. Wherever possible, overnight lighting would not be used. If night lighting was needed, low- impact techniques would be used and shields would be installed to prevent the degradation of the night sky view, protect cave resources, and avoid disrupting the physiological processes of plants and animals. None of the alternatives would be likely to affect the appreciation of the night sky or interfere with activities of nocturnal creatures, including bats. For these reasons, lightscape and night sky have been dismissed from further consideration.

Soundscape. NPS managers are directed by NPS DO 47, *Soundscape Preservation and Noise Management*, to protect, maintain, or restore natural soundscapes unimpaired by inappropriate or excessive noise. In this directive, noise is defined as appropriate or inappropriate relative to the purpose of the park, the level of visitor services available, and the activities pursued by visitors. None of the alternatives would introduce long- term inappropriate noise levels to the memorial. The actions would occur in areas with an existing level of development, including, roads, trails, and visitor facilities. The temporary nature of noise produced during construction or revegetation and restoration would be appropriate in the developed environment and would not cause adverse effects on the human or natural environment. None of the actions in the alternatives would introduce inappropriate noise to remote or undeveloped portions of the memorial, and no action would appreciably alter the baseline ambient noise level.

Cultural Resource Topics

Museum Collections. The memorial’s museum collections are housed and maintained at several locations outside the memorial boundaries. Most are in storage at the Western Archeological and Conservation Center in Tucson, AZ. Botanical specimens are housed primarily at Arizona State

University, with mammal, herpetological, and botanical collections being stored at Arizona State University and the University of Arizona. Some historical and ethnographic objects are displayed at the visitor center, and archival collections are kept in the administrative offices. None of the alternatives would affect the present dispositions of storage of the collections, nor would their care, maintenance, or access by researchers be affected. For these reasons, museum collections have been dismissed from further consideration.

Hazardous Materials

No hazardous materials are known to exist in the memorial.

Energy Requirements and Conservation Potential

The management policies of the National Park Service direct parks to plan, site, construct, and operate facilities to conserve energy and reduce pollution. Any new facility should include consideration of energy efficiency and minimal consumption of nonrenewable fuels. The construction in the action alternatives would integrate the components of energy conservation and efficiency mandated under NPS policy. Neither the no- action alternative nor any of the action alternatives would measurably affect local or regional energy consumption; therefore, energy requirements and conservation potential have been dismissed as a topic for further consideration.

Mining Areas

The memorial contains no active mining claims. There are 62 openings in 8 mining areas, and mitigation to reduce safety hazards is required at 23 of the openings. This work is underway and continues as funds become available. The mitigation is an operational issue; therefore, it is outside the scope of this document. It has been determined that some of the mines have historic qualities. Some of

them are described in the “Affected Environment” chapter.

Indian Trust Resources

According to the American Indian Trust Fund Management Reform Act of 1994 and President Clinton’s “Memorandum for the Heads of Executive Departments and Agencies” dated April 29, 1994, it is required that agencies determine the effects on tribal trust resources caused by federal government plans, projects, programs, and activities. One definition of tribal trust resources (from Secretarial Order 3206, Babbitt, June 5, 1997, subsection B, section 3) is as follows:

Those natural resources, either on or off Indian lands, retained by or reserved by or for Indian tribes through treaties, statutes, judicial decisions, and executive orders, which are protected by a fiduciary [trust] obligation on the part of the United States.

None of the lands in Coronado National Memorial are trust resources according to this definition; therefore, this topic has not been analyzed.

Land Use Trends

The federal government is the primary land-owner in Arizona and in Cochise County. Only 41% of Cochise County is privately owned. The land east of the memorial is predominantly agricultural, but increasingly more agricultural lands are being converted to residential use. The 2001 *Southern San Pedro Valley Area Plan* envisions future growth in the region, with zoning proposed for commercial development. Although some alternatives would result in more visitation and staffing over time, the need for increased commercial services or residential development in the county would be negligible. The economic effects of more visitation and the elimination of grazing in the memorial are discussed under “Effects on the

Socioeconomic Environment.” None of the alternatives in this plan would conflict with current land uses in the region or with uses prescribed by any regionwide plans. Therefore, impacts on land use and trends will not be analyzed.

Conservation Potential and Requirements for Natural or Depletable Resources

None of the alternatives would result in the extraction of resources from the memorial. As noted under “Servicewide Laws and Policies,” page 13, under all the alternatives, the staff of the national memorial would apply ecological principles to ensure that the memorial’s natural resources would be maintained.

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low- Income Populations*, requires that all federal agencies incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs/policies on minorities and low- income populations and communities.

For the purpose of fulfilling EO 12898, in the context of the National Environmental Policy Act, the planning team assessed the alternatives presented in this plan during the planning process. The team determined that none of these alternatives would result in significant direct or indirect negative or adverse effects on any minority or low-income population or community. The following information contributed to this conclusion:

- There would be no direct or indirect negative or adverse health effects on any

minority or low- income population or community.

- The effects on the natural and socioeconomic environment that would result from any alternative would not cause disproportionate adverse effects on any minority or low- income population or community.

The planning team actively solicited public participation in the planning process and gave equal consideration to all input from people, regardless of age, race, income status, or other socioeconomic or demographic factors.

Coronado National Memorial employees have consulted and worked with the American Indian tribes in the area and will continue to do so in cooperative efforts to improve communications and resolve any problems that might occur.

Transportation and Access

The topic of transportation and access will not be discussed in this document because several access routes are available, and no impacts on access to the memorial would be expected. In view of the high level of service on the road leading to the memorial, the relatively low density development proposed by the *Southern San Pedro Valley Area Plan*, and the modest increase in development considered in the alternatives in this management plan, none but modest increases would be expected in the number of vehicles using AZ 92 to Palominas.

The average annual daily traffic (AADT) for the main memorial road (five- year average) is 104. The peak flow on the main road is 300 vehicles per day.

ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE



INTRODUCTION TO THE ALTERNATIVES

This chapter contains descriptions of the five alternatives. Alternative A, the “no- action” (status quo) alternative, which is described first, reflects existing conditions and serves as a basis for comparing and evaluating the other alternatives. Then the four “action” alternatives (B, C, D, and E), which propose the future direction for Coronado National Memorial, are described.

Alternative B is the National Park Service’s preferred alternative. In the process used to select the preferred alternative, the planning team found that alternative B would best safeguard the resources and scenic values of Coronado National Memorial while making those resources easily accessible for visitors. The cultural and natural values of the memorial would be protected in this alternative, and the visitor experience would be enhanced.

Before the action alternatives were developed, information was gathered about the resources in the national memorial. Information about the issues and the scope of the project was solicited from the public, other agencies, special interest groups, and memorial staff through newsletters, meetings, and personal contacts. This helped with the development of the action alternatives. All the alternatives are intended to support the memorial’s mission, purpose, and significance and to address issues; avoid unacceptable resource impacts; and respond to public desires and concerns.

DECISION POINTS

Three decision points were identified during this process. They are phrased as questions that each alternative must answer, as follows:

- What level of development should be allowed while still preserving the memorial’s cultural and natural resources unimpaired for future generations?

- What visitor use should be accommodated while preserving the integrity of the resources and maximizing visitor services?
- What is the best way to tell the public the story of Coronado National Memorial while not neglecting significant resources within the authorized boundaries?

These preliminary concepts were presented to the public for review in spring 2001. Following the public review, an evaluation process called “Choosing by Advantages” was used to compare the four alternatives and to develop the National Park Service’s preferred alternative (see appendix D). The other preliminary alternatives were subsequently refined to reflect a similar level of detail as that developed for the preferred alternative.

In the following pages, the use of management prescriptions for each alternative is described, with a table outlining the general types of activities that could occur in those areas. Then the alternatives are described. The descriptions of the four action alternatives are organized by management prescriptions.

PRIORITIES WITHIN ALTERNATIVES

Priorities have been assigned to the actions discussed for each alternative; that is, certain actions would be implemented first (as having primary priority), with others implemented later according to the time likely to be needed to develop facility plans, obtain construction funding, and/or reach necessary partnership agreements. For the purposes of organization and comparison, existing conditions are shown as having primary priority, with some other actions given secondary priority.

The potential environmental effects of implementing each alternative are presented in the “Environmental Consequences” chapter.

Although a general management plan contains the analysis and justification for future funding, the plan in no way guarantees that money will be forthcoming. This *General Management Plan* will establish a vision of the future that will guide the year- to- year management of Coronado National Memorial, but the full implementation of a plan could take a number of years.

IMPLEMENTATION COSTS

The general gross costs listed for each alternative are rough estimates of the implementation costs to be used only for comparing the alternatives; they cannot be used for budgetary purposes. The costs were developed with the use of conceptual- type estimates for fiscal year 2001 (FY 01). After a final plan is selected and the memorial is closer to implementing individual actions, more detailed and accurate cost estimates will need to be developed. All implementation costs have been rounded to the nearest thousand dollars.

CARRYING CAPACITY

The General Authorities Act for the National Park Service, section 604, amended section 12(b), requires that general management plans establish a carrying capacity for a unit of the national park system, saying, among other things, that there must be “identification of an implementation commitment for visitor carrying capacities for all areas of the [national park system] unit” In addition, there also is a requirement in the *NPS Management Policies 2001* that general management plans address the issue of visitor carrying capacity. The use of the concept of carrying capacity in planning infrastructure and visitor management programs would be expected to result in effective and efficient management.

Visitor Experience and Resource Protection

Currently, visitor use has had few adverse effects on the resources of Coronado National Memorial. Illegal trafficking in people and drugs in this border area has adversely affected the visitor experience, and the memorial continues to address the issue of illegal activities through operational actions. As visitor numbers increase, it is expected that the potential for adverse effects natural and cultural resources also would increase. Large numbers of visitors at one time also could affect the visitor experience. Therefore, it is important for the National Park Service to be proactive in preventing problems that could result from visitors’ use of the memorial.

While carrying capacities are being determined during the implementation of this plan, the memorial staff will monitor resources and visitor use and judge whether or not the capacities (desired conditions) are being exceeded in any area. It is not likely that the expected levels of facility development and visitation and the expected types of use would cause unacceptable impacts on the desired visitor experience or on the memorial’s resources. However, if carrying capacities were exceeded, the NPS staff would take actions to restore conditions to acceptable levels. For example, the number of visitors could be restricted or facilities could be modified.

For the life of this plan, visitation would be controlled by the number and quality of facilities, by management actions, and through cooperative local efforts and initiatives. The National Park Service’s visitor experience and resource protection (VERP) process would guide planners and managers in addressing carrying capacity and assessing impacts on resources and the visitor experience. The process would enable the staff to avoid some of the problems that other areas have experienced when visitation has not been managed to protect the resources or the quality of the visitor experience.

The Coronado National Memorial staff has identified desired conditions for various areas. In picnic areas, the desired condition would be to have minimal impact on natural resources, with the areas shaded by native vegetation. These areas would be managed to allow for a mix of young and mature trees and shrubs. Visitor groups would be managed not to exceed the number of tables and grills available. Off- road parking would not be allowed.

The visitor center would be designed and managed to accommodate individuals and small groups, even when larger groups were present, and to help them to understand the memorial's story. Adequate areas would be developed for interpretive programs and media that would tell the stories of the memorial's natural and cultural resources. Adequate space for cars and recreational vehicles would be available in the area near the visitor center. Resources would be preserved by not allowing off- road parking or the development of "social" roads.

Coronado Cave and the trail to the cave would be managed to minimize speleothem damage, dust in the area, and trash along the trail and in the cave. Visitors would have an opportunity to understand the cave's ecosystem.

Montezuma Pass, the trail to Montezuma Peak, and the rest of the memorial's trails would be managed to minimize trash and erosion and to discourage the creation of "social" trails. Visitors would have opportunities to understand the memorial's natural resources, to see views related to the story of the Coronado Expedition, to experience a variety of habitats in the memorial (such as grasslands, shrubs, and hillsides), and to participate in various recreational activities (such as birding, walking, and nature study.) All this would be done to offer a variety of trail experiences to hikers of all abilities.

After the *General Management Plan* is approved, indicators of resource conditions will

be developed, as will indicators of visitor experiences and standards. Monitoring programs will be initiated to measure resource condition and the visitor experiences. The indicators will establish the maximum amount of deterioration of the quality of resources or experience that will be allowed before management action is taken. Such indicators will reflect the overall condition of the area and allow the measurement of effects on the memorial's biological, physical, and cultural resources and on the visitor experience.

Monitoring

To ensure that the memorial's desired conditions would remain as prescribed, monitoring would be carried out to evaluate resource conditions and visitor experiences. Through monitoring, the memorial staff would determine if these indicators were viable and acceptable; if not, the indicators might be modified. The process of determining how much is too much is a dynamic one. Critical to the success of this process are identifying standards and indicators and adjusting the management strategies when monitoring indicates that conditions are out of standard.

Surveys would be conducted at specific times and places to determine whether or not the desired visitor experience conditions were being met. Follow- up plans (such as a revised resource management plan) might be necessary to test these numbers. Work might be needed after this plan is approved to "fine-tune" the indicators, standards, and monitoring methods.

MANAGEMENT PRESCRIPTIONS

Management prescriptions identify management zones and define the levels of visitor use, management activities, and development. They provide a foundation for all subsequent management decisions in the national memorial. Along with the memorial's mission goals, they are the basis for establishing the

long- term goals of the memorial's strategic plan and for developing implementation plans such as resource management plans.

After the action alternatives for future conditions and management in the national memorial were developed, the planning team developed management prescriptions (management zones) that would apply — although differently — to each action alternative. For example, it is known that an area would need to be set aside for NPS offices and housing, another area would be needed for educational activities, and another where visitors could get information about the national memorial and decide what they wanted to do. Thus, four management prescriptions came into being for the national memorial: conservation, education, visitor services, and operations / special use, as shown in table 1 (p. 37).

In each prescription area, a particular combination of resource conditions, visitor understanding, and facilities and activities could take place. Each alternative would require a different application or configuration of these management prescriptions. For example, the visitor facilities in alternative B might be located in a different place than in alternative C, depending on the overall concept. One alternative's concept might call for additional visitor opportunities; thus, the visitor services management prescription might be larger in that alternative than in an alternative calling for more conservation. The configuration of the management prescriptions for each alternative was next placed on a map; this resulted in the alternative maps in this document.

When drawing boundaries for management prescriptions in the action alternatives, we considered known resource conditions. For example, we have done our best to avoid directing new uses into areas that contain sensitive natural resources.

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES

Boundary Adjustments

As one of the provisions of Public Law (PL) 95- 625, the National Parks and Recreation Act of 1978, Congress directed that the National Park Service consider, as part of a planning process, what modifications of external boundaries might be necessary to carry out the purposes of a unit of the national park system. After passing this act, Congress also passed PL 101- 628, the Arizona Desert Wilderness Act. Section 1216 of that act directs the secretary of the interior to develop criteria to evaluate any proposed changes to the existing boundaries of individual park units, and section 1217 calls for the National Park Service to consult with affected agencies and others regarding any proposed boundary change and to provide a cost estimate of the acquisition cost, if any, related to the boundary adjustment.

To implement these provisions, NPS *Management Policies 2001* indicates that the National Park Service will conduct studies of potential boundary adjustments and may make boundary revisions as follows:

- to protect significant resources and values or to enhance opportunities for public enjoyment related to park purposes
- to address operational and management issues such as the need for access or the need for boundaries to correspond to logical boundary delineations such as topographic or natural features or roads
- to protect resources that are critical to fulfilling park purposes

NPS policies instruct that any recommendation to expand the boundaries of a unit be preceded by a determination that the added lands would be feasible to administer, considering size, configuration, ownership, cost, and other factors. Another requirement

is that other alternatives for management and resource protection must have been considered and found not to be adequate.

The present boundaries of Coronado National Memorial are sufficient to carry out its mission. The expansion of the national memorial would not meet any of the criteria for boundary revisions. It is not feasible to acquire all lands within the national memorial's viewshed because the cost would be prohibitive, and Arizona land policies prohibit this action. Instead, Coronado National Memorial would seek to identify and work with willing partners to achieve the goal of protecting the viewshed.

Wilderness Suitability

The National Park Service is required by its management policies and the 1964 Wilderness Act to evaluate all NPS units to determine what lands are suitable for inclusion in the national wilderness preservation system. This evaluation has been undertaken with the use of the following criteria taken from the 1964 Wilderness Act and *NPS Management Policies 2001*:

- The earth and its community of life are untrammelled by humans, who are visitors and do not remain.
- The area is undeveloped and retains its primeval character and influence, without permanent improvements or human habitation.
- The area generally appears to have been affected primarily by the forces of nature, with the imprint of humans' work substantially unnoticeable.
- The area is protected and managed so as to preserve its natural conditions.
- The area offers outstanding opportunities for solitude of a primitive and unconfined type of recreation.

The lands in Coronado National Memorial do not meet some of these primary suitability criteria, including "The area offers outstanding opportunities for solitude or a primitive and unconfined type of recreation" and "The area generally appears to have been affected primarily by the forces of nature, with the imprint of humans' work substantially unnoticeable." The paved main road bisects the national memorial, and most of the memorial's lands are less than 1 mile from that road, which is visible from most areas within the boundary. Road noise can be heard from most places. The one area in the national memorial that is protected from road noise is the south slope of Smuggler's Ridge, which in itself is too small an area, at several hundred acres, to constitute a high-quality wilderness area. The topography and vegetation are such that houses, roads, and "the imprint of humans' work" outside the boundaries are visible from most parts of the national memorial. (See "Appendix C: Wilderness Suitability Assessment.")

Furthermore, Forest Service and NPS managers did not consider wilderness in Coronado National Memorial a significant complement to the

Miller Peak Wilderness in Coronado National Forest, nor did they believe it would be advantageous to either agency's management of its area. Planning is still underway for a protected area in Mexico that might be adjacent to Coronado National Memorial; however, it is unlikely that a core protected area of a future Mexican reserve would be close to the national memorial. The views of Mexico played a significant role in the establishment of Coronado National Memorial, and they continue to be a focal point in telling the story of Coronado's expedition and interpreting our lasting ties to Mexico. The mission of Coronado National Memorial is to preserve those views, and the alternatives presented in this document offer various ways to protect the memorial's natural resources and viewshed and conserve them for future generations.

Protection of Visitors and Resources

In any of the action alternatives, the memorial would undertake a series of measures designed to better protect park resources and provide for enhanced visitor safety. The goal of these would be to eliminate cross-border illegal activities and to provide a sufficient law enforcement presence to deter such activities. The already existing partnerships between the

Forest Service, the U.S. Border Patrol, and the Bureau of Land Management would be strengthened to provide for additional security. The memorial would continue to seek to upgrade communication capability and other equipment necessary to accomplish this task.

TABLE 1: MANAGEMENT PRESCRIPTIONS

Management Prescription	Resource Condition	Visitor Understanding	Facilities and Activities
Conservation	Management manipulation of vegetation limited to providing for seclusion, scenic vistas, or what is needed to maintain a healthy ecosystem; high degree of protection for cultural and natural resources in these areas.	Visitors could reflect on history and significance of memorial; these places, although adjacent to higher use areas, would allow a degree of solitude; few encounters with memorial staff; encounters with other visitors moderate to low, depending on time of day and season.	Access not easy because of rugged terrain and topography; activities could include resource appreciation, hiking, and horseback riding in permitted areas; primitive roads for administrative access would remain.
Education	Resource manipulation would vary by amount and intensity of physical development needed for a particular type of recreation; natural setting retained as much as possible; resources could be modified for essential visitor services, but changes would harmonize with natural and cultural environment; areas managed to provide best, most appropriate interpretation of resources; recreation would take place where effects on resources would be minimal.	Visitors could learn about memorial's important resources and reflect on its history and significance; self- guided or ranger- led experiences easily accessible; where possible without unacceptable resource impacts, visitors could interact with resources; direction and structure (trails, interpretive media, signs) provided, but some opportunities for discovery would remain; possible chances for solitude at certain times; encounters with staff and interaction with other visitors moderate.	The primary development in this prescription would be trails for interpretation; possibly benches, shade, a minimal number of signs, overlooks, wayside exhibits, self- guided activities and other interpretive media, and wildlife viewing areas; predominant activities could include seeing the resources and attending interpretive walks and talks.
Visitor Services	Resources might have been previously disturbed; either no or few significant resources present; significant resources managed according to NPS policy and legal requirements; only native vegetation species used except in interpretive exhibits.	These areas would be easily accessible and offer education and interpretation about national memorial's significant resources; visitors could contact staff easily; possibly frequent interactions with other visitors, large groups, and staff.	Development might include kiosks, a visitor center, comfort stations, first aid station, short trails, hardened parking, drinking fountains, fee collection station, pay phones, paved and unpaved roads, picnic areas — facilities could support various social activities such as picnicking, special events, other group activities.

Management Prescription	Resource Condition	Visitor Understanding	Facilities and Activities
Operations / Special Use	These areas located where limited or no significant resources or in previously disturbed areas; as much as practicable, NPS facilities in these areas would be models of best management practices and sustainable development; natural environment could be modified for NPS operations but still harmonize with surrounding environment; although environment might be highly modified, pollutants and other evidences of disturbance (stormwater runoff; dust from construction) contained and mitigated before affecting adjacent areas; facilities and operations buffered so that visitors would not see them or be disturbed by associated noise; physical footprint of NPS structures and stored material minimal; private landowners encouraged to adopt best management practices.	Visitor use limited; no visitors allowed on any private property within national memorial's boundaries; visitors only slightly aware of this prescription and its facilities; a few national memorial facilities might be showcased here to help visitors understand how the National Park Service works to develop sustainable and environmentally responsible facilities in an arid environment.	These areas could include grounds and structures used for administration and operations: housing, offices, maintenance shops and yards, indoor and outdoor storage areas, fire engine storage, employee parking, security systems, a secured law enforcement area, heating and cooling systems, phone lines, computer lines, and water supply and treatment; facilities would give staff a safe, efficient, comfortable, and aesthetic work environment; hardened circulation and parking areas appropriate here; housing would have enough space for family activities; these areas would include utility rights- of- way, administrative roads, and private property.

ALTERNATIVE A: NO ACTION (EXISTING MANAGEMENT DIRECTION)

CONCEPT

Alternative A, the no- action alternative, is presented for comparison with the “action” alternatives B, C, D, and E. In alternative A, the current management direction would continue, and there would be no significant change in the interpretation or management of the memorial.

DESCRIPTION

The administrative offices for the memorial would remain in their current location away from the visitor center. The visitor center would remain to house offices for the memorial’s interpretive staff. All of the memorial’s interpretive themes would be equally emphasized in this alternative. The memorial would work with Mexico to develop interpretive programs that would include activities to support Mexican and American / national memorial natural and cultural resources.

Cultural and natural resources would be managed, protected, and maintained as staff time and funding allowed. Cultural and natural resource inventory work and monitoring would continue and would be expanded if possible. The staff of the national memorial would encourage the research that is needed to “fill in the gaps.” The memorial would continue not to have management prescriptions, but areas of the memorial are managed for visitor services, operations, education, and conservation.

Coronado National Memorial has acquired the remaining parcels of the Montezuma Ranch, which is in the grasslands south of the main memorial road. In all the alternatives, the property would be evaluated to determine if the ranch was eligible for listing on the National Register of Historic Places. In

alternatives A, B, C, and E, the memorial staff then would work toward removing the early 20th century ranch structures to improve the views for which the memorial was established. If the structures were found eligible for listing on the national register, the National Park Service would initiate consultation with the Arizona state historic preservation office to determine what features could be removed, or documented and then removed. After the documentation was completed, the staff would work to eliminate all the ranch structures. The goal would be to remove as many of these features as possible, then to restore the natural contours of the area and revegetate it with native species. Exotic species of plants and trees that do not contribute to the cultural landscape also would be removed from the ranch area as time and funding permitted.

The abandoned powerlines and roads on memorial property would be allowed to deteriorate. If any section should prove to be a safety hazard, that portion would be removed.

The *Livestock Management Plan* (NPS 2000b) established long- term and short- term strategies for managing permitted (authorized) livestock operations. The Joe’s Spring and Montezuma grazing allotments are now being managed according to that plan. This eventually will include the retirement of one or both allotments if the permittees are willing. Nonnative plants are not being seeded or planted on the allotments. No new range structures are planned for the Joe’s Spring allotment, and any grazing improvement needed in the Montezuma allotment would be planned to maintain agave populations. Relative to pre “Livestock Management Plan” conditions, grazing intensity and duration have been reduced, and the season of use has been shortened by removing cattle during the agave bolting and flowering period. These

changes have improved range conditions on both allotments.

The memorial has partnering agreements to assist in law enforcement, communications, and fire protection. In addition, the national memorial continues to work with schools and other organizations to interpret the area's cultural heritage and ecosystems.

Costs

The yearly cost for administering the memorial is estimated at \$740,000. This estimate is very general, in keeping with the general nature of the alternatives; the estimate should be used only for comparing the alternatives.

IMPLEMENTATION

Staffing

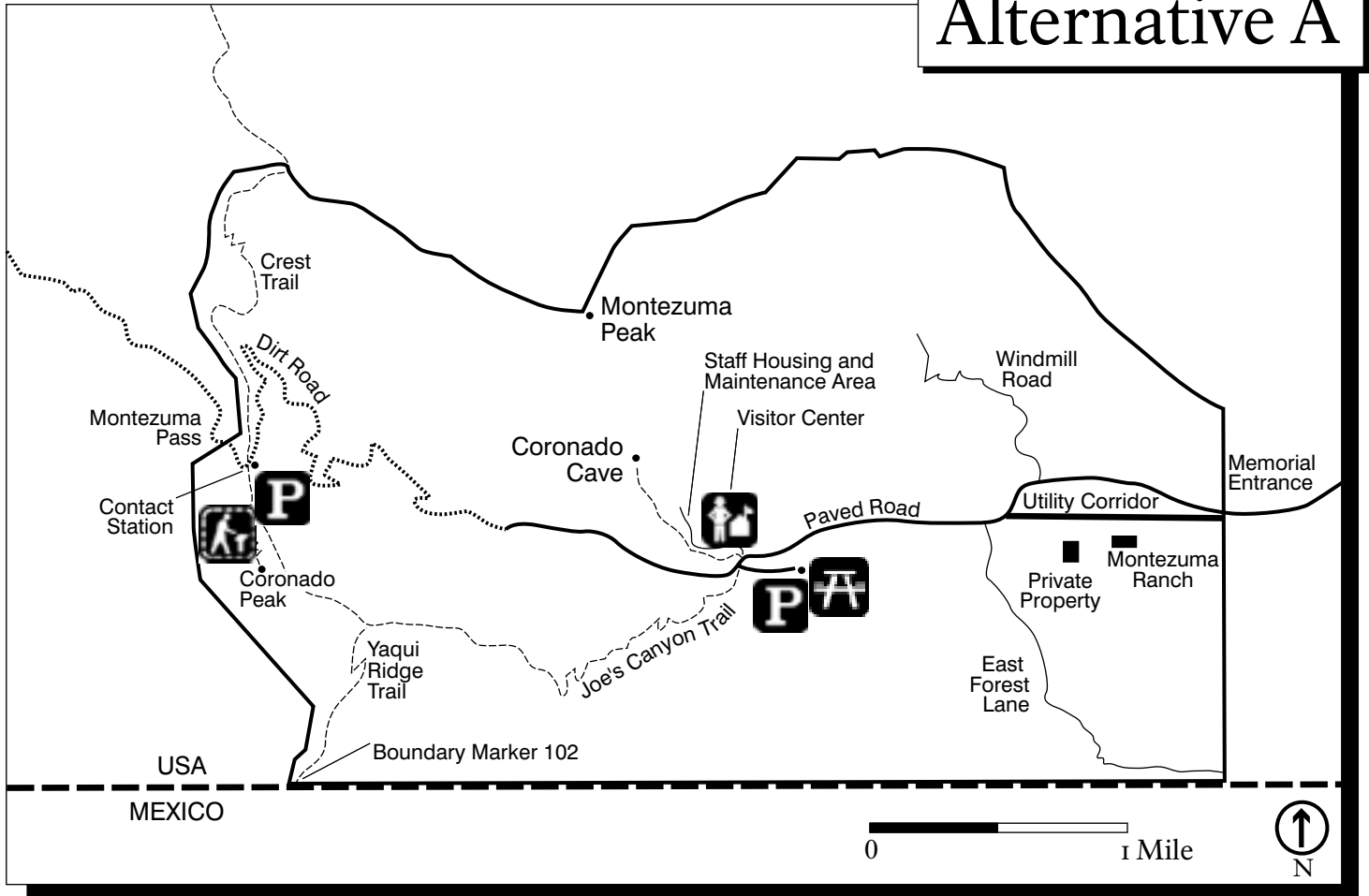
The following list of staffing (12 full- time-equivalent (FTE)* employees) reflects the current staffing at Coronado National Memorial. The FY 2001 pay scale has been used for all staffing costs.

*FTE = full- time equivalent position; that is, one FTE (40- hours per week) position could be two employees, each working 20 hours per week, one employee working 30 hours per week and another employee working 10 hours per week, or four employees each working 10 hours per week — or other combinations.

TABLE 2: STAFFING COSTS, ALTERNATIVE A

Superintendent	1 FTE
Park ranger (protection)	5 FTE
Park ranger (biologist)	1 subject to furlough
Park ranger (interpretation)	1 FTE
Park ranger (interpretation)	1 seasonal
Resource management specialist	1 FTE
Administrative officer	1 FTE
Maintenance worker	2 FTE

Alternative A



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ALTERNATIVE B: ENHANCE OPPORTUNITIES WHILE PROTECTING RESOURCES (PREFERRED ALTERNATIVE)

CONCEPT

The concept of alternative B is to enhance educational and recreational opportunities while protecting, perpetuating, and ensuring public understanding of the national memorial's resources. Under this alternative, the National Park Service would seek to develop new ways for the public to gain an appreciation and understanding of the memorial's natural and cultural resources. Educational and interpretive goals would be emphasized.

DESCRIPTION

The description of this alternative, like the descriptions of the three other action alternatives, is organized by management prescription. The various kinds of prescription are described at the beginning of this chapter. Also see the Alternative B map.

Conservation Prescription

The conservation prescription would encompass all the lands in the memorial not included in other prescriptions. Grazing in the national memorial would be discontinued. The abandoned powerline along the road to Montezuma Pass would be removed and revegetated with native species. All existing trails would be retained, and a trail would be developed between the entrance and the visitor center. That trail would be partially in the education prescription and partially in the conservation prescription.

Education Prescription

In alternative B, the education prescription would be applied to the trail from Montezuma Pass to Coronado Peak, the trail to Coronado

Cave, and the grasslands north and south of the main memorial road. The interpretation of the memorial's resources would be more intensive in these areas.

The grasslands include the Montezuma Ranch structures, which would be evaluated to determine if the ranch is eligible for listing on the National Register of Historic Places. The management of the ranch would be as described for alternative A, page 39.

East Forest Lane would continue to be used for NPS operations and as an access road to the grazing allotments. When grazing was discontinued and the road was not needed for NPS operations, it would be removed and revegetated with native species, and part of the road might be used as a trail.

A trail accessible to people with disabilities would be developed in the grasslands north of the memorial's entrance. Part of Windmill Road would be used to make this trail. In addition, a loop trail would be developed in this northern grassland area. When grazing was discontinued and Windmill Road was not needed for NPS/memorial operations, the remaining part of that road would be removed and revegetated with native species. A loop trail also would be developed in the grasslands south of the main road in the Montezuma Ranch area, possibly using part of East Forest Lane.

Any trailhead would have minimal development, possibly including a restroom. Facilities at the trailhead would be placed in areas with natural screening, or vegetative screening could be added to protect the viewshed. The trail from Montezuma Pass to Coronado Peak would be studied to determine how much of that trail could be made accessible to visitors with disabilities. The interpretive media on the trail would be rehabilitated and updated.

Visitor Services Prescription

The visitor services prescription would encompass the area around the visitor center, the parking area at the top of Montezuma Pass, and the main road through the memorial. The visitor center would be rehabilitated to offer updated interpretation of the memorial's natural and cultural resources. The memorial's interpretive themes would be presented at the visitor center and at Montezuma Pass. An annex would be added behind the visitor center to accommodate more office space, storage, and a multipurpose room to house a variety of visitor and staff activities and programs. The annex would be designed to blend into the environment and complement the architecture of the visitor center.

The visitor center is potentially eligible for listing on the National Register of Historic Places. A determination of eligibility would be carried out, and any work done on that building would be planned to protect the features that could make it eligible.

Adding the annex would require removing the interpretive trail just outside the visitor center. A trail would be developed between the memorial entrance and the visitor center. A new interpretive trail would be developed near the current picnic area. A parking area for staff and visitors (up to four buses or recreational vehicles) would be added in the picnic area across from the visitor center, and a group picnic area would be added near the site of the former fiesta area.

Even though no formal cultural landscape evaluation has been made for the visitor center area, NPS professionals have determined that it would be important to protect the views of the visitor center as approached from the parking lot.

The visitor shelter on Montezuma Pass would be converted into a minimal contact station. This might necessitate a slight expansion of the facility, but as much of the existing footprint would be used as possible. The

contact station would be staffed during peak visitation times. The interpretive media at this location would be rehabilitated and updated. A small structure might be constructed in this area to house communication equipment.

Alternative B could include a shuttle system to carry visitors between the visitor center and the contact station at Montezuma Pass. During the early years of this alternative's implementation, such a shuttle system would not be either necessary or feasible. However, in later years, it might be appropriate to establish such a shuttle service in the memorial.

Before establishing any shuttle system, the National Park Service would conduct a feasibility study. The shuttle system would be implemented only if sufficient need and economic feasibility for such a transit system in the park could be established. The feasibility study would also analyze possible approaches to shuttle system operations and maintenance, such as by the National Park Service or a concessioner, and identify the most appropriate method for implementation.

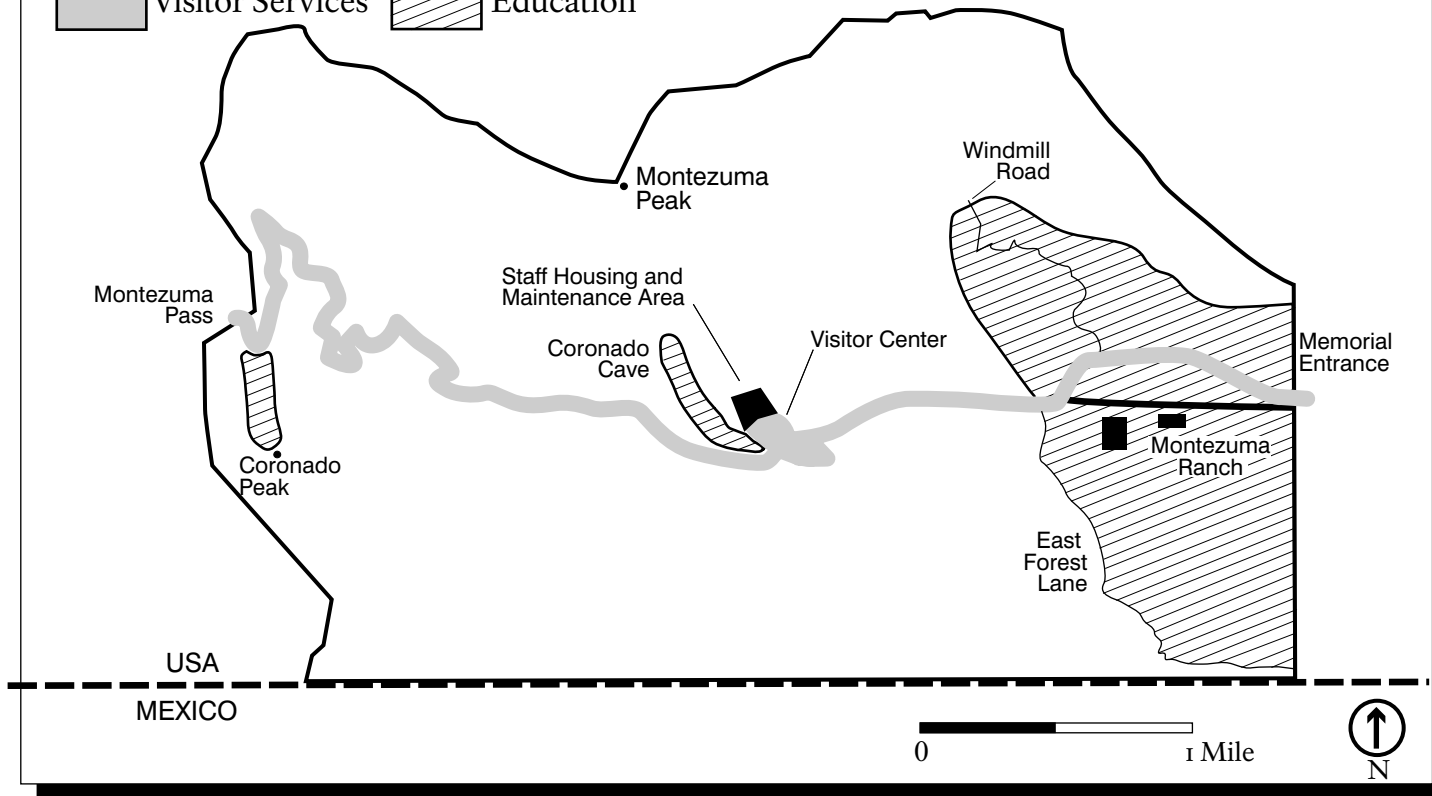
Up to three new pullouts and waysides would be developed along the main memorial road. The pullout near the end of the paved road would be expanded to accommodate a picnic area and wayside. Two more pullouts would be added along the road in locations where drivers could stop and see the memorial's scenic vistas.

Operations / Special Use Prescription

The operations / special use prescription would comprise the staff housing and maintenance area, private inholdings, and a utility corridor. The current staff housing area would remain, with the option of constructing a four-unit structure that could serve as housing for temporary employees, volunteers, researchers, and others working at the memorial for short periods. The two trailer pads would be retained, and all development would be screened from the road by vegetation.

Alternative B Preferred Alternative

Management Zones



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PARTNERSHIPS, PROGRAMS, AND ACTIVITIES

To encourage better public appreciation and understanding of its mission, the national memorial would work toward the creation of an offsite cultural festival to celebrate the various cultures associated with the memorial. Although not serving as the chief sponsor of this event, Coronado National Memorial would support its creation. For such a festival, the National Park Service would encourage emphasis on the historical aspects of the Coronado Expedition. The memorial staff would work with interested groups and organizations in Mexico to develop interpretive programs, which could include activities to support Mexican and American natural and cultural resources.

To offer opportunities for people to better understand and appreciate the memorial's story, the staff would work either separately or in cooperation with the others to promote special events inside and outside the memorial. These events could include special programs highlighting the historic event of the Coronado Expedition, the expedition's legacy, and its impact on the present American Southwest. The national memorial would expand its work with other organizations and groups to support the preservation of the regional ecosystem. This could include working with partners to preserve the views of the San Pedro Valley from Montezuma Pass.

Coronado National Forest is in the process of developing a trail outside of Coronado National Memorial. In this alternative, it is recommended that this trail should not be directly connected to trails in Coronado National Memorial but instead should be routed to end in Ash Canyon in Coronado National Forest.

IMPLEMENTATION

Priorities for Implementation

The actions proposed under this alternative, which would be implemented over the next 15 years, have been divided into primary and secondary priorities for funding and to guide implementation.

Primary Priority. Certain actions have been assigned primary priority for the following reasons:

- The action would address crucial resource protection needs.
- It would remedy serious infrastructure concerns.
- It would accommodate immediate interpretive or visitor use needs.
- It would have to be accomplished before subsequent steps could be taken.

Primary priority has been assigned to the following actions:

- inventory, document, and interpret cultural and natural resources
- cooperate with American Indian tribes in developing programs
- develop interpretive media supportive of the national memorial's interpretive themes
- rehabilitate and update the Coronado Peak trail and facilities at Montezuma Pass
- take action to keep visitation levels in line with goals while maintaining visitor experiences and resource protection
- establish management prescription areas
- work with others to develop festivals and programs celebrating the various aspects of the memorial's mission
- finish evaluating Montezuma Ranch for eligibility for the National Register of Historic Places

ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE

- restore natural contours and revegetate Montezuma Ranch
- revegetate areas around the memorial
- design and build the visitor center annex and a parking area
- develop two trails in the grassland
- discontinue grazing in the Coronado National Memorial

Secondary Priority. Secondary priority has been assigned to some actions for the following reasons:

- The action would require or would benefit from the results of primary priority actions.
- It would address intermediate priority resource protection needs.
- It would address intermediate interpretation or visitor use needs.

Secondary priority has been assigned to the following actions:

- improve parking at the picnic area
- develop new picnic facilities
- revegetate East Forest Lane if feasible
- design and build employee housing

- expand the monitoring of natural resource trends
- develop the last two new trails
- rehabilitate the visitor center
- create new pullouts and waysides

Staffing

The FY 2001 pay scale has been used for all estimates of staffing costs. This alternative would retain the current base staff of 12. Table 3 shows the additional full- time equivalents that would be needed to implement this alternative. These staffing figures represent the additional positions or upgrading of positions that would be needed to carry out alternative B. The additional positions that would be needed for this alternative are interpreters, resource specialists, maintenance workers, and administrative support staff.

Implementation Costs

The proposed construction, rehabilitation, and revegetation costs for alternative B would range from \$1.8 million to \$2.2 million. This estimate is general, in keeping with the general nature of this conceptual management plan and alternatives, and it should be used only for comparing the alternatives.

TABLE 3: GENERAL ESTIMATE FOR STAFFING COSTS, ALTERNATIVE B

Staffing	FTE	Costs
Existing and authorized staffing	12.0	\$ 740,000
Added staff needed for primary priority actions	9.5	439,000
Total	21.5	\$1,179,000

ALTERNATIVE C: FOCUS ON RESOURCE PROTECTION WHILE FULFILLING THE MEMORIAL'S MISSION

CONCEPT

The concept of alternative C is to enhance the conservation and preservation of the memorial's cultural and natural resources for future generations. Under this alternative the National Park Service would seek to minimize intrusive features on the memorial's landscape (such as modern structures, paved roads, and additional trails). Educational and interpretive goals would be accomplished by updating interpretive media and by using a more assertive outreach program.

DESCRIPTION

The description of this alternative, like the descriptions of the three other action alternatives, is organized by management prescription. The various kinds of prescription are described at the beginning of this chapter. Also see the Alternative C map.

Conservation Prescription

All the lands in the memorial not included in other prescriptions would be placed in the conservation prescription. The abandoned powerline along the road to Montezuma Pass would be removed and revegetated with native species.

Studies would be undertaken to determine the feasibility of reintroducing native species of plants and animals in the memorial that were present at the time of the Coronado Expedition. Grazing in the national memorial would be discontinued.

The Montezuma Ranch would be evaluated for eligibility for listing on the National Register of Historic Places, then managed as described for alternative A, page 39. East Forest Lane would continue as an unpaved

road used for NPS operations. Abandoned roads within the memorial boundaries would be restored to natural contours and revegetated to provide for larger areas of unbroken habitat for wildlife.

Education Prescription

In alternative C the education prescription would be applied to the trail from Montezuma Pass to Coronado Peak and the trail to Coronado Cave. More intensive interpretation would be offered in these areas.

Visitor Services Prescription

The visitor services prescription would encompass the area around the visitor center, the picnic area, the parking area at the top of Montezuma Pass, and the main road through the memorial. The interior of the visitor center would be remodeled to provide more space for interpreting the memorial's natural and cultural resources.

The visitor center is potentially eligible for listing on the National Register of Historic Places. A determination of eligibility would be carried out, and any work done on that building would be planned to protect the features that could make it eligible.

Some staff positions would be relocated outside, but near, the national memorial, possibly in a leased facility. This would relieve congestion of offices and parking at the visitor center. Adequate staff office and storage space would be arranged offsite. The interpretive trail at the visitor center would be upgraded and made accessible for people with disabilities.

The picnic area and its access road would be retained. Parking for four buses or

recreational vehicles would be developed in the picnic area. The former fiesta grounds and social trails in the picnic area would be restored to natural contours and revegetated. On the road to Montezuma Pass, the dirt storage area near the end of the paved part of the main memorial road would be removed and the area restored to natural contours and revegetated. The current visitor contact facility at Montezuma Pass would be updated and rehabilitated.

Operations / Special Use Prescription

The operations / special use prescription would comprise the staff housing and maintenance area, private inholdings, and a utility corridor. The current staff housing area would remain, with the option of constructing a four- unit structure that could serve as housing for temporary employees, volunteers, researchers, and others working at the memorial for short periods. The two trailer pads would be retained, and all development would be screened from the road by vegetation.

PARTNERSHIPS, PROGRAMS, AND ACTIVITIES

To encourage better public appreciation and understanding of its mission, the national memorial would strongly emphasize reaching beyond the memorial's boundaries and working with various groups to tell the memorial's compelling story. This could be accomplished by creating partnerships with local schools (elementary to university level) and working with the U.S. Forest Service, the Bureau of Land Management, and others. The memorial staff would work with Mexican groups to develop interpretive programs, which could include activities to support Mexican and American natural and cultural resources.

Coronado National Forest is in the process of developing a trail outside of Coronado

National Memorial. In this alternative, it is recommended that this trail should not be directly connected to trails in Coronado National Memorial but instead should be routed to end in Ash Canyon in Coronado National Forest.

IMPLEMENTATION

Priorities for Implementation

The actions proposed under this alternative, which would be implemented over the next 15 to 20 years, have been divided into primary and secondary priorities for funding and to guide implementation.

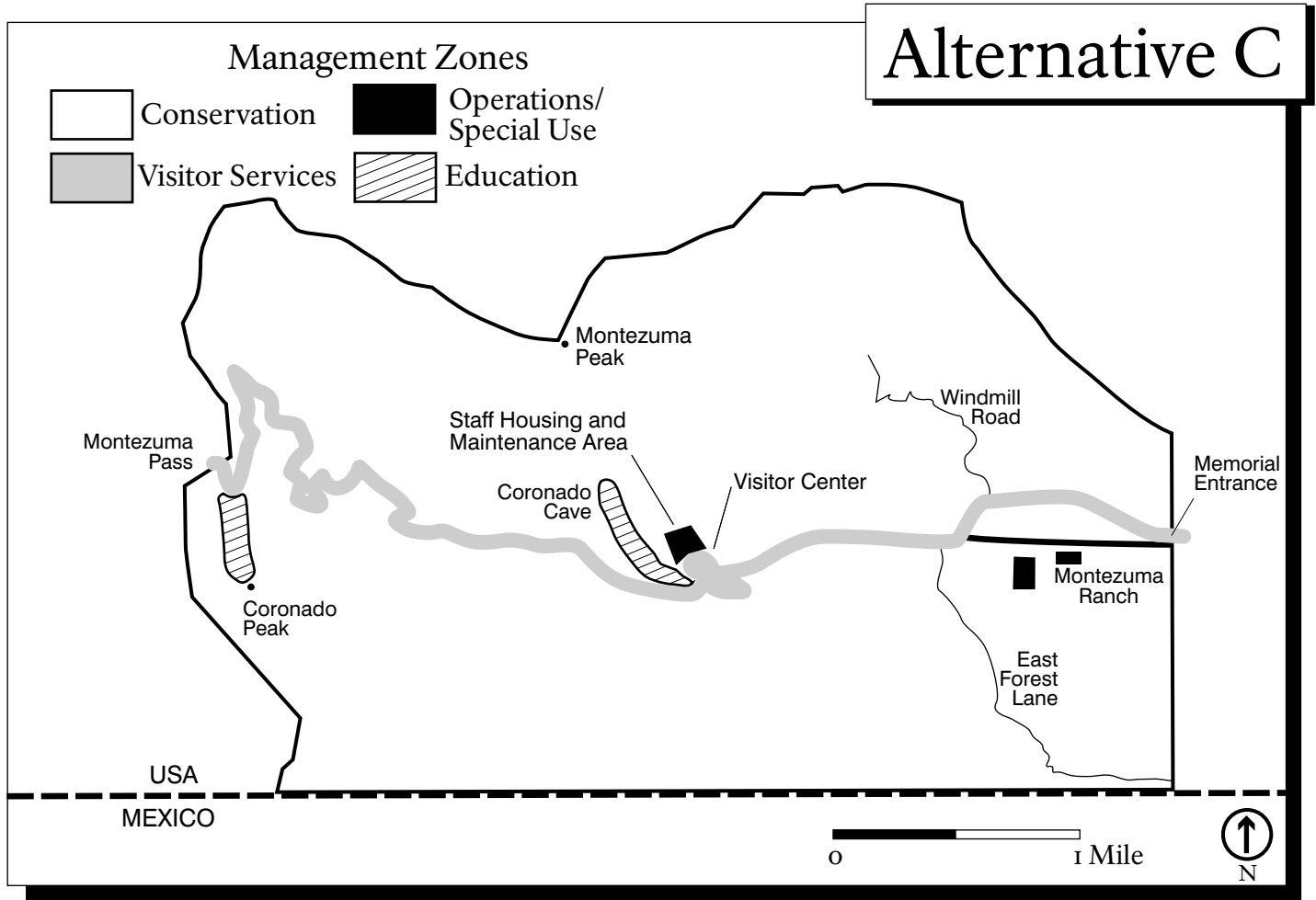
Primary Priority. Certain actions have been assigned primary priority for the following reasons:

- The action would address crucial resource protection needs.
- It would remedy serious infrastructure concerns.
- It would accommodate immediate interpretive or visitor use needs.
- It would have to be accomplished before subsequent steps could be taken.

Primary priority has been assigned to the following actions:

- inventory, document, and interpret the memorial's cultural and natural resources
- cooperate with American Indian tribes in developing programs
- develop interpretive media that will support Coronado National Memorial's interpretive themes
- rehabilitate and update trail and facilities at Montezuma Pass
- take action to keep visitation levels in line with goals while retaining visitor experiences and resource protection
- establish management prescription areas

Alternative C



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- study the feasibility of reintroducing native plants and animals
- rehabilitate the visitor center and move some staff offsite
- begin to develop programs with partners
- remove powerlines, restore fiesta grounds and dirt storage area; revegetate all
- finish evaluating Montezuma Ranch for eligibility for the National Register of Historic Places
- restore natural contours and revegetate Montezuma Ranch
- upgrade the interpretive trail at the visitor center and make it accessible for visitors with disabilities
- discontinue grazing on memorial lands

Secondary Priority. Some actions have been assigned secondary priority for the following reasons:

- The action would require or would benefit from the results of primary priority actions.
- It would address intermediate priority resource protection needs.
- It would address intermediate interpretation or visitor use needs.

Secondary priority has been assigned to the following actions:

- design and build employee housing
- expand monitoring of natural resource trends
- develop new bus or recreational vehicle parking in the picnic area

Staffing

The FY 2001 pay scale has been used for all estimates of staffing costs. This alternative would retain the current base staff of 12 full-time equivalents. Table 4 shows the number of additional positions that would be needed to implement this alternative. These staffing figures represent the additional positions or upgrading of positions that would be needed to carry out alternative C. The additional positions that would be needed are interpreters, resource specialists, maintenance workers, and administrative support staff.

Implementation Costs

The proposed construction, rehabilitation, and revegetation costs for alternative C would range from \$1.4 million to \$1.8 million. This estimate is general, in keeping with the general nature of this conceptual management plan and alternatives, and it should be used only for comparing the alternatives.

TABLE 4: GENERAL ESTIMATE FOR STAFFING COSTS, ALTERNATIVE C

Staffing	FTE	Costs
Existing and authorized staffing	12.0	\$740,000
Added staff needed for primary priority actions	5.0	226,000
Total	17.0	\$966,000

ALTERNATIVE D: CREATE AN INTERNATIONAL EXPERIENCE FOR VISITORS TO THE NATIONAL MEMORIAL

CONCEPT

The concept of alternative D would be to develop a fuller international experience for visitors to the memorial. The National Park Service would seek new ways for the public to gain an appreciation and understanding of the international aspects of the memorial. Educational and interpretive activities would emphasize the memorial's international aspects.

DESCRIPTION

The description of this alternative, like the descriptions of the three other action alternatives, is organized by management prescription. The various kinds of prescription are described at the beginning of this chapter. Also see the Alternative D map.

Conservation Prescription

All the lands in the memorial not included in other prescriptions would be placed in the conservation prescription. The abandoned powerline along the road to Montezuma Pass would be removed and revegetated with native species.

Abandoned roads within the memorial boundaries would be restored to natural contours and revegetated. Grazing in the Montezuma allotment would be discontinued because the new trails would result in conflicts with grazing operations.

Education Prescription

In alternative D, the education prescription would encompass the trail from Montezuma Pass to Coronado Peak, the trail to Coronado Cave, and the grasslands north of the memorial road. The interpretive media on the

trail from Montezuma Pass to Coronado Peak would be rehabilitated and updated. The National Park Service would explore the feasibility of making part of the trail to Coronado Peak accessible for visitors with disabilities. More interpretive media would be developed for the trail to Coronado Cave. A new interpretive trail would be developed north of the main national memorial road in the grasslands, possibly using Windmill Road. This trail would avoid going into the Joe's Spring allotment.

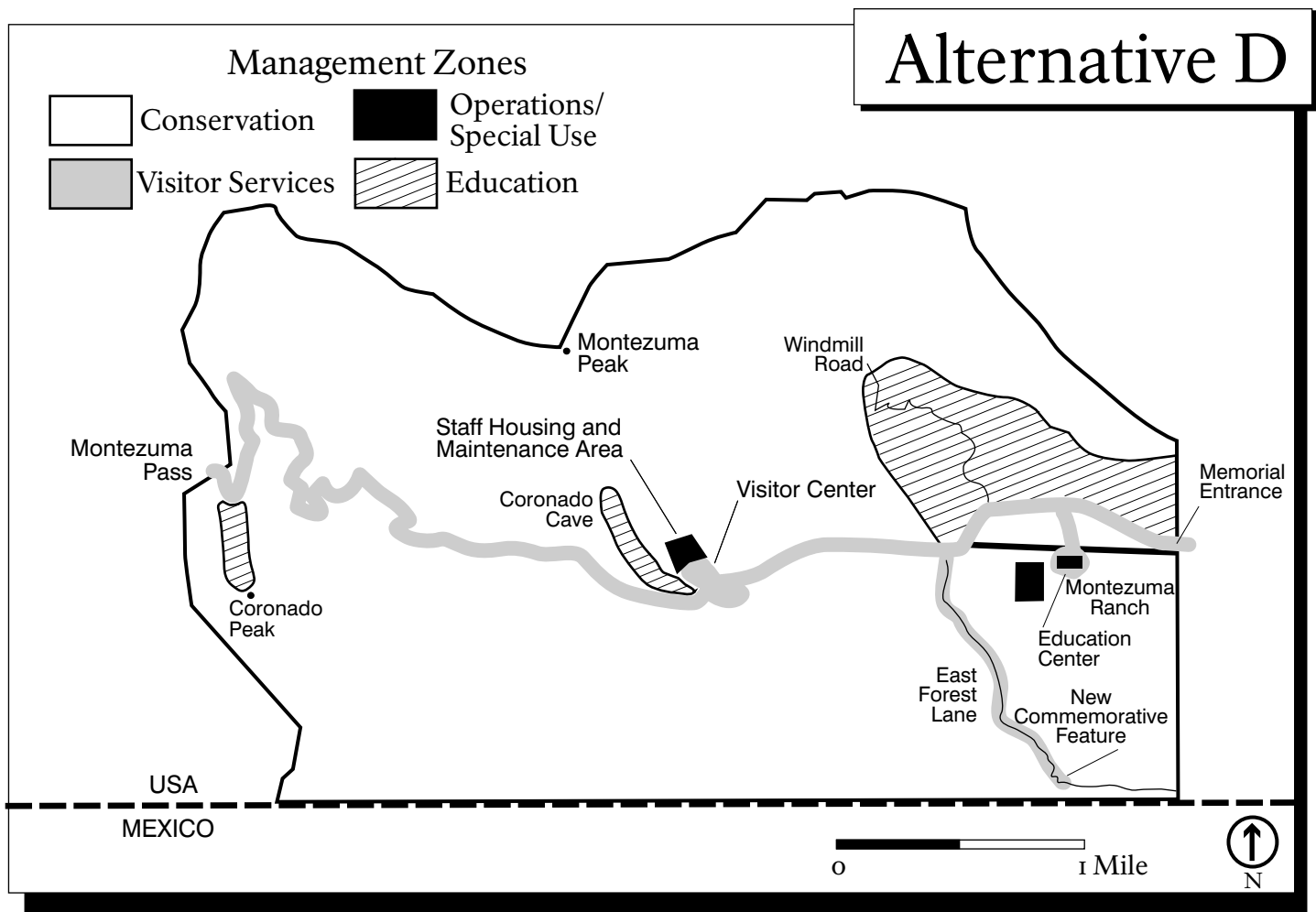
Visitor Services Prescription

The visitor services prescription would comprise the area around the visitor center, the picnic area, the parking area at the top of Montezuma Pass, East Forest Lane from the main memorial road to the border, the vicinity of Montezuma Ranch, and the main road through the memorial.

East Forest Lane, a dirt road in the grasslands south of the main memorial road that crosses an ephemeral streambed, would be upgraded to a two-lane paved road. The upgraded East Forest Lane would closely follow its current alignment.

A structure to be built at the end of East Forest Lane would be designed in a manner that would offer visitors views into Mexico. The structure would be large enough to include areas for interpretive media and protection from the sun and weather. Here, visitors would have an opportunity to understand and appreciate the Coronado Expedition, fostering international amity. This commemorative feature would become a main attraction of the memorial.

After the Montezuma Ranch structures and cultural landscapes were evaluated to determine if any would be eligible for listing



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on the National Register of Historic Places, the memorial staff would consult with the Arizona state historic preservation office to determine what features could be removed, adaptively used, or documented and then removed.

Alternative D includes the construction of an educational center in the Montezuma Ranch area, with space for some staff offices. Any structures found eligible for listing on the national register would be considered for adaptive use as part of the educational center complex. The educational center would be designed to blend into the environment, and the area around it would be landscaped in a way that would not detract from the views from Coronado Peak. An interpretive trail would be developed near the educational center. Any structures found ineligible for the national register would be demolished.

Design solutions would be used to preserve the views from Montezuma Pass into the San Pedro Valley. The roads to the educational center and the commemorative feature would be designed and built to minimize their visual impact on views from Montezuma Pass. This could include using paving materials that would blend in with the natural landscape.

The visitor center would be expanded and rehabilitated to offer updated interpretation of the memorial's natural and cultural resources, as well as containing added office and storage space. Interpretation at the visitor center would include emphasis on themes related to the memorial's international aspects. The interpretive trail at the visitor center would be removed.

The visitor center is potentially eligible for listing on the National Register of Historic Places. A determination of eligibility would be carried out, and any work done on that building would be planned to protect the features that could make it eligible.

More parking would be added for the vehicles of visitors and NPS staff; some could be in the

present picnic area. The road to the picnic area would be upgraded, and picnic sites would be added in the former fiesta area.

The visitor shelter on Montezuma Pass would be converted into a minimal contact station. This might necessitate a slight expansion of the facility, but as much of the existing footprint would be used as possible. The contact station would be staffed during peak visitation times. The interpretive media at this location would be rehabilitated and updated. A small structure might be constructed in this area to house communication equipment. In addition, a smaller structure might be necessary to house communication equipment.

In the latter part of its implementation period, alternative D might include a shuttle system to carry visitors between the visitor center and the contact station at Montezuma Pass. As described in alternative B, a feasibility study would be conducted to establish the need for and economic feasibility of such a system. The feasibility study would also identify the most appropriate approach to shuttle system operations and maintenance, such as by the National Park Service or a concessioner.

A picnic area and a wayside exhibit would be added to the pullout near the end of the main memorial road.

Operations / Special Use Prescription

The operations / special use prescription would comprise the staff housing and maintenance area, private inholdings, and a utility corridor. The current staff housing area would remain, with the option of constructing a four-unit structure that could serve as housing for temporary employees, volunteers, researchers, and others working at the memorial for short periods. The two trailer pads would be retained, and all development would be screened from the road by vegetation.

PARTNERSHIPS, PROGRAMS, AND ACTIVITIES

To promote the international aspects of the memorial, the feasibility of sponsoring Coronado-related events at various universities would be explored. These might include lectures, original papers, and cultural activities, which could take place onsite or offsite.

Coronado National Forest is in the process of developing a trail outside of Coronado National Memorial. In alternative D, the National Park Service would encourage the entry of this trail into the memorial, where it could proceed down a trail to be developed paralleling East Forest Lane. It could then exit the memorial in the direction of the San Pedro River.

A hiking and horseback trail would be developed parallel to East Forest Lane. That trail would exit the memorial in the direction of the San Pedro River.

IMPLEMENTATION

Priorities for Implementation

The actions proposed under this alternative, which would be implemented over the next 15 to 20 years, have been divided into primary and secondary for funding and to guide implementation.

Primary Priority. Certain actions have been assigned primary priority for the following reasons:

- The action would address crucial resource protection needs.
- It would remedy serious infrastructure concerns.
- It would accommodate immediate interpretive or visitor use needs.
- It would have to be accomplished before subsequent steps could be taken.

Primary priority has been assigned to the following actions:

- inventory, document, and interpret the memorial's cultural and natural resources
- cooperate with American Indian tribes in developing programs
- develop interpretive media supportive of the national memorial's interpretive themes
- rehabilitate and update Coronado Peak trail and facilities at Montezuma Pass
- take action to keep visitation levels in line with goals and to maintain visitor experiences and resource protection
- establish management prescription areas
- rehabilitate and expand the visitor center
- begin to develop programs with partners
- develop a picnic area and wayside at the pullout near the end of the main national memorial road
- finish evaluating Montezuma Ranch for eligibility to the National Register of Historic Places
- restore natural contours and revegetate Montezuma Ranch
- construct an educational center at Montezuma Ranch
- discontinue grazing in the Montezuma allotment

Secondary Priority. Some actions have been assigned secondary priority for the following reasons:

- The action would require or would benefit from the results of primary priority actions.
- It would address intermediate priority resource protection needs.
- It would address intermediate interpretation or visitor use needs.

Secondary priority has been assigned to the following actions:

- pave East Forest Lane
- design and construct a commemorative feature at the end of East Forest Lane
- develop grasslands trails
- design and build employee housing
- expand the monitoring of natural resource trends
- develop new parking for buses or recreational vehicles in the picnic area

Staffing

The FY 2001 pay scale has been used for all estimates of staffing costs. This alternative would retain the current base staff of 12. Table

5 shows the additional full- time equivalents that would be needed to implement this alternative. These staffing figures represent the additional positions or upgrading of positions that would be needed to carry out alternative D. The additional positions that would be needed for this alternative are interpreters, resource specialists, maintenance workers, and administrative support staff.

Implementation Costs

The proposed construction, rehabilitation, and revegetation costs for alternative D would range from \$3.5 million to \$4 million. This estimate is general, in keeping with the general nature of this conceptual management plan and alternatives, and it should be used only for comparing the alternatives.

TABLE 5: GENERAL ESTIMATE FOR STAFFING COSTS, ALTERNATIVE D

Staffing	FTE	Costs
Existing and authorized staffing	12.0	\$ 740,000
Added staff needed for primary priority actions	9.5	468,000
Total	21.5	\$1,208,000

ALTERNATIVE E: ENHANCE INTERPRETATION AND THE EFFICIENCY OF OPERATIONS

CONCEPT

The concept of alternative E would be to offer an enhanced experience for visitors while creating a more sustainable national memorial. Under this alternative, the National Park Service would seek new ways to educate the public about the significance of the Coronado Expedition, primarily within the boundaries of the national memorial.

DESCRIPTION

The description of this alternative, like the descriptions of the three other action alternatives, is organized by management prescription. The various kinds of prescription are described at the beginning of this chapter. Also see the Alternative E map.

This alternative would involve the creation of a new visitor center, into which the educational center also would be placed. All trails in the memorial would be retained. A new interpretive trail and one other trail would be developed, as described below.

Conservation Prescription

All the lands in the memorial not included in other prescriptions would be placed in the conservation prescription. The abandoned powerline along the road to Montezuma Pass would be removed and revegetated with native species.

The grasslands south of the main memorial road include the Montezuma Ranch structures, which would be evaluated to determine if the ranch is eligible for listing on the National Register of Historic Places, then the Montezuma Ranch would be managed as described for alternative A, page 39.

Grazing in the Joe's Spring allotment would be discontinued. East Forest Lane would continue to be used for NPS operations and as an access road to the Montezuma grazing allotment.

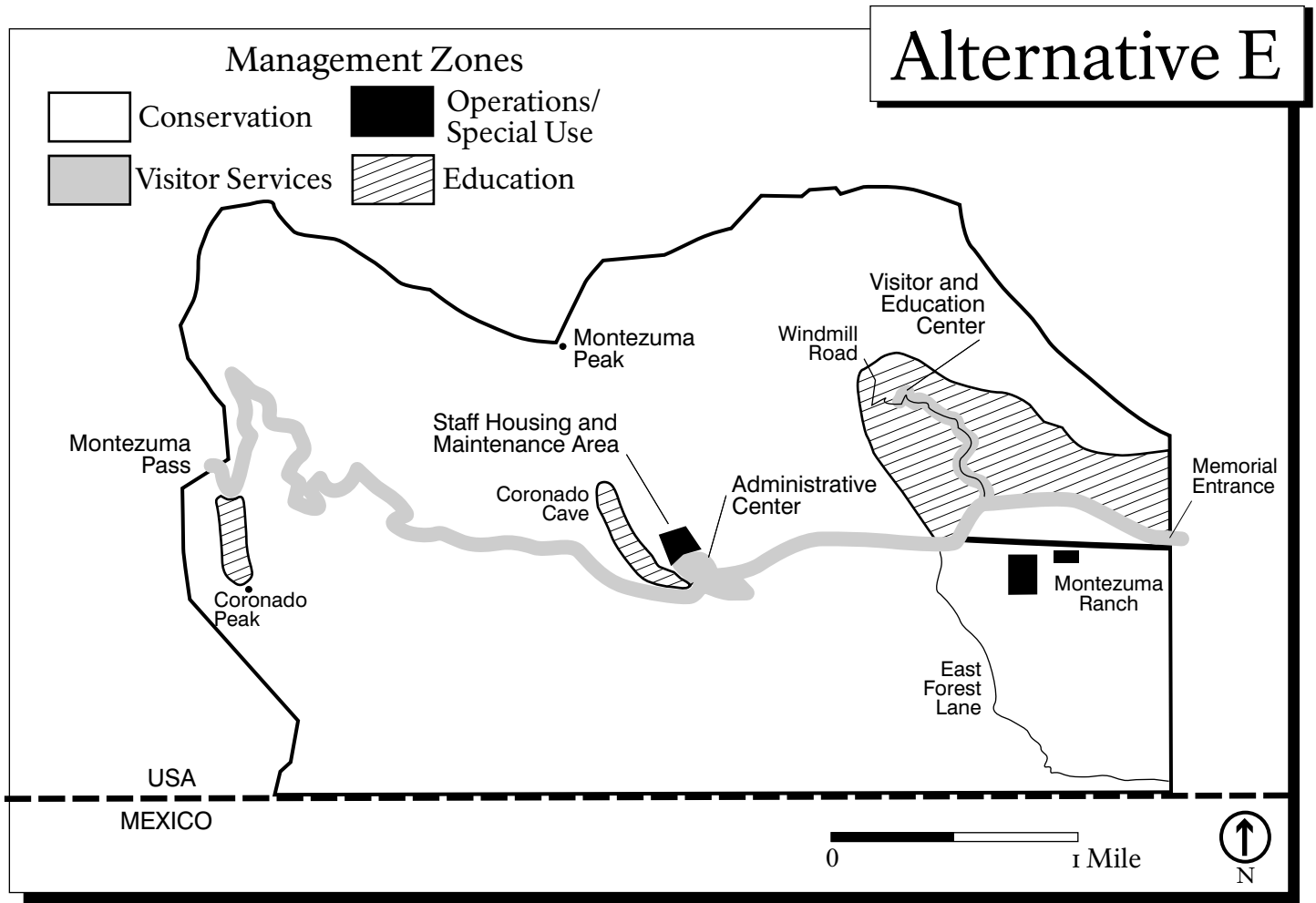
Education Prescription

The education prescription in alternative E would encompass the trail from Montezuma Pass to Coronado Peak, the trail to Coronado Cave, and the grasslands north of the memorial road. The interpretive media on the trails to Coronado Peak and Coronado Cave would be rehabilitated and updated to better explain the memorial's purpose and resources. A new interpretive trail would be developed at the new visitor and educational center to offer interpretation of the memorial's grasslands. Another trail would be developed between the current visitor center and the new visitor and educational center.

Visitor Services Prescription

The visitor services prescription in alternative E would comprise the present visitor center, the picnic area, the parking area at the top of Montezuma Pass, the main memorial road, part of Windmill Road, and the area where the new visitor and educational center would be located.

The new visitor center would be constructed about 1.2 miles west of the east entrance to the national memorial. From this location, visitors would have panoramic views of the San Pedro River Valley and the United States–Mexico border. These views would enhance the ability of the staff to tell the complete human and natural history stories significant to Coronado National Memorial.



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The educational center would be incorporated into the building, as would offices for the NPS interpretive staff. The principles of sustainable design would be used to create this building, which would blend into the environment as much as possible. Its architectural style would be typical of the Spanish colonial period. A hardened parking area for the structure would be built.

The present visitor center would be converted into administrative offices. The trailheads, parking, and restrooms would remain as at present. The picnic area would remain as at present, with social trails revegetated. The main memorial road would remain as at present; Windmill Road would be made into a two-lane paved road, with the alignment changed slightly to provide access to the new visitor and educational center.

The present visitor center is potentially eligible for listing on the National Register of Historic Places. A determination of eligibility would be carried out, and any work done on that building would be planned to protect the features that could make it eligible. The visitor shelter at Montezuma Pass would be converted into a sheltered minimal contact station. This might require a slight expansion of the structure, but the existing footprint would be used as much as possible.

In the latter part of its implementation period, alternative E might include a shuttle system to carry visitors between the visitor center and the contact station at Montezuma Pass. As described in alternative B, a feasibility study would be conducted to establish the need for and economic feasibility of such a system. The feasibility study would also identify the most appropriate approach to shuttle system operations and maintenance, such as by the National Park Service or a concessioner.

Operations / Special Use Prescription

The operations / special use prescription would comprise the staff housing and

maintenance area, private inholdings, and a utility corridor. The current staff housing area would remain, with the option of constructing a four-unit structure that could serve as housing for temporary employees, volunteers, researchers, and others working at the memorial for short periods. The two trailer pads would be retained, and all development would be screened from the road by vegetation.

PARTNERSHIPS, PROGRAMS, AND ACTIVITIES

All the memorial's interpretive themes would be equally emphasized in alternative E, and strong emphasis would be placed on working with various groups to tell these stories and reach beyond the memorial's boundary. This would be done by creating partnerships with local schools (elementary to university level) and working with the U.S. Forest Service, the Bureau of Land Management, and others. The memorial staff would work with Mexican groups to develop interpretive programs, which could include activities to support Mexican and American natural and cultural resources.

Coronado National Forest is in the process of developing a trail outside of Coronado National Memorial. In alternative E, it is recommended that this trail should enter the memorial from the east and end at the new visitor and educational center.

IMPLEMENTATION

Priorities for Implementation

The actions proposed under this alternative, which would be implemented over the next 15 to 20 years, have been divided into primary and secondary priorities for funding and to guide implementation.

Primary Priority. Certain actions have been assigned primary priority for the following reasons:

- The action would address crucial resource protection needs.
- It would remedy serious infrastructure concerns.
- It would accommodate immediate interpretive or visitor use needs.
- It would have to be accomplished before subsequent steps could be taken.

Primary priority has been assigned to the following actions:

- inventory, document, and interpret the memorial's cultural and natural resources
- cooperate with American Indian tribes in developing programs
- develop interpretive media supportive of the national memorial's interpretive themes
- rehabilitate and update the Coronado Peak trail and facilities at Montezuma Pass
- take action to keep visitation levels in line with goals and to maintain visitor experiences and resource protection
- establish management prescription areas
- design and construct a new visitor center and convert the present visitor center to offices
- construct a road to the new visitor center
- discontinue grazing at Joe's Spring allotment
- begin to develop programs with partners
- finishing evaluating Montezuma Ranch for eligibility to the National Register of Historic Places
- restore the natural contours and revegetate Montezuma Ranch

Secondary Priority. Some actions have been assigned secondary priority for the following reasons:

- The action would require or would benefit from the results of primary priority actions.
- It would address intermediate priority resource protection needs.
- It would address intermediate interpretation or visitor use needs.

Secondary priority has been assigned to the following actions:

- design and build employee housing
- develop grassland trails
- expand the monitoring of natural resource trends
- develop new parking for buses or recreational vehicles in the picnic area

Staffing

The FY 2001 pay scale has been used for all estimates of staffing costs. This alternative would retain the current base staff of 12. Table 6 shows the additional full-time equivalents that would be needed to implement this alternative. These staffing figures represent the additional positions or upgrading of positions that would be needed to carry out alternative E. The additional positions that would be needed for this alternative are interpreters, resource specialists, maintenance workers, and administrative support staff.

Implementation Costs

The proposed construction, rehabilitation, and revegetation costs for alternative E would range from \$4.2 million to \$4.7 million. This estimate is general, in keeping with the general nature of this conceptual management plan and alternatives, and it should be used only for comparing the alternatives.

TABLE 6: GENERAL ESTIMATE FOR STAFFING COSTS, ALTERNATIVE E

Staffing	FTE	Costs
Existing and authorized staffing	12.0	\$ 740,000
Added staff needed for primary priority actions	10.0	499,000
Total	22.0	\$1,239,000

MITIGATING MEASURES

The following mitigating measures would be used to avoid or minimize potential impacts on natural and cultural resources from construction activities, use by visitors, and national memorial operations. These measures would apply to all alternatives.

Natural and cultural resource management activities would be integrated to avoid potential impacts from natural processes, construction, and NPS operations.

NATURAL RESOURCES

The resources of the national memorial, including air, caves, soils, vegetation, water, and wildlife, would be inventoried and monitored to avoid or minimize the effects of future development.

New facilities would be built in previously disturbed areas or in carefully selected sites with as small a construction footprint as possible.

All new developments not tied to an approved plan would be designed to be temporary and reversible. If feasible, new developments would be confined to areas outside the 100-year floodplain.

New facilities would be built on soils that are suitable for development. Soil erosion would be minimized by limiting the time that soil was left exposed and by using various erosion control measures such as erosion matting or silt fencing. Once work was completed, construction areas would be revegetated with native plants in a timely manner.

Erosion controls and other mitigating measures would be implemented to ameliorate the negative impacts of natural processes.

To prevent water pollution during construction, erosion control measures would be used,

and the equipment would be regularly inspected for leaks of petroleum and other chemicals.

A runoff filtration system would be built to minimize water pollution from parking areas.

To minimize visitor-caused water pollution, interpretive displays and programs would be prepared, regulations on use would be established, and ranger patrols would be initiated when necessary.

Areas used by visitors (such as trails) would be monitored for signs of disturbance of native vegetation. To control potential impacts on plants from trail erosion or social trails, barriers would be used, and disturbed areas would be revegetated with native plants. In addition, the national memorial would practice public education and erosion control measures.

Based on recommendations by the U.S. Fish and Wildlife Service in its 1995 recovery plan for the Mexican spotted owl (USFWS 1995b), no construction activities would be conducted in protected activity centers during the breeding season.

A variety of techniques would be employed to reduce the impacts on wildlife. These could include visitor education programs, restrictions on visitor activities, and ranger patrols.

In areas proposed for development, surveys would be conducted for the presence of rare or uncommon wildlife species, and whenever possible, animals would be trapped and transferred to adjacent suitable habitat within the memorial.

Wherever possible, agaves and other native plants in construction sites would be transplanted to prevent the loss of important food

sources for nectar-feeding bats and other threatened or endangered animal species.

Integrated inventory and monitoring of natural resources would be undertaken to provide a comprehensive understanding of the memorial's wildlife, vegetation, and habitat.

CULTURAL RESOURCES

For all projects that would involve ground disturbance or would affect ethnographic resources or cultural landscapes, mitigating measures would be undertaken in consultation with the Arizona state historic preservation office and the Advisory Council on Historic Preservation.

In accordance with NPS policies and procedures, the national memorial would continue to protect cultural resources to the greatest extent possible with current funding and staffing levels. Disturbing significant resources would be avoided wherever possible. Where avoidance or preservation could not be achieved, mitigation would be carried out under the guidance of the procedures of the Advisory Council on Historic Preservation (36 CFR 800).

All unsurveyed areas in the national memorial would be inventoried for archeological, historical, and ethnographic resources and cultural landscapes. Archeological surveys would be conducted in unsurveyed areas where development was planned to determine the extent and significance of archeological resources in those areas.

To ensure the preservation of cultural landscapes in the national memorial, those landscapes would be documented and treatments would be identified as part of the implementation of the *General Management Plan*.

Wherever possible, projects and facilities would be located in previously disturbed or

developed areas. Developments would be designed to avoid known or suspected archeological resources.

Project design features would be modified whenever possible to avoid effects on cultural resources. New developments would be located on sites that would blend in with cultural landscapes and would not be adjacent to ethnographic resources. If necessary, vegetative screening would be used to minimize impacts on cultural landscapes and ethnographic resources.

Archeologists would monitor ground-disturbing construction in areas where subsurface remains might be present.

"Stop work" provisions and other protective measures would be included in project documents implementing the alternatives. Construction would be restricted to the immediate vicinity of the projects, and no new disturbance would be originated outside the designated project area. If previously unknown archeological resources were unearthed during construction work, or if human remains were discovered, work in the discovery area would be stopped and a professional archeologist would make an evaluation following consultation between NPS national memorial and regional staff and the Arizona state historic preservation office.

The staff at the national memorial would consult with affiliated American Indian tribes to develop and accomplish the programs of Coronado National Memorial in a way respectful of the beliefs, traditions, and cultural values of the American Indian tribes that have ancestral ties to the lands.

The National Park Service would accommodate access to and the ceremonial use of American Indian sacred sites by American Indian religious practitioners. This would be done in a manner consistent with memorial purposes. The Park Service would avoid adversely affecting the physical integrity of these sacred sites, and would not interfere

with American Indian use of traditional areas or sacred resources.

Measures would be taken to protect human remains, sacred objects, associated funerary objects, and objects of cultural patrimony. If such items were found, the superintendent and contracting officer of the national memorial would be notified immediately. Any artifacts found in association with the remains — funerary objects, sacred objects, and objects of cultural patrimony — would be left *in situ*. If the remains were determined to be of American Indian origin, the memorial superintendent would notify the appropriate tribes according to the Native American Graves Protection and Repatriation Act (NAGPRA) and its implementing regulations. Consultation with the affected tribes would be undertaken.

All preservation, rehabilitation, and restoration efforts for historic structures would be carried out in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties, with Guidelines for Preserving, Rehabilitation,*

Restoring, and Reconstructing Historic Buildings, as would the daily, cyclical, and seasonal maintenance of historic resources.

Opportunities would be provided for tribes to participate in cultural resource identification and protection activities to prevent impacts on archeological and ethnographic resources.

Through interpretive programs, visitors would be encouraged to respect tribal offerings and archeological resources and leave them undisturbed.

The staff at the national memorial would ensure that objects housed in repositories or institutions outside the national memorial would be preserved, protected, and documented according to NPS standards and procedures. The staff also would adhere strictly to NPS standards and guidelines on the display and care of artifacts. Irreplaceable items would be kept above the 500- year floodplain.

FUTURE PLANS AND STUDIES NEEDED

The development of a general management plan is the first planning step for Coronado National Memorial; it sets the overall vision and direction for the national memorial and identifies future planning needs. The following studies (not listed in priority order) are mandated by the National Park Service and will be needed to fully implement the approved *General Management Plan* for the national memorial.

Comprehensive Interpretive Plan — This plan would provide the next level of detailed planning for interpretation at Coronado National Memorial. It would expand the broader guidance in the *General Management Plan* and provide a cohesive approach toward implementation, including all media and personal services.

Cultural Landscape Report — A cultural landscape report is needed for abandoned mines and for the entire memorial's viewshed. This report would consist of three parts: (a) a cultural landscape inventory, (b) recommendations for treatment of the landscape, and (c) documentation of the actual treatment.

Ethnographic Overview and Assessment — An ethnographic overview and assessment would emphasize the review and analysis of accessible archival and documentary data on the memorial's ethnographic resources and the groups that traditionally define such cultural and natural features as significant to their ethnic heritage and cultural viability. Limited interviews and discussions with traditionally associated people would be conducted to assess and augment the documentary evidence and identify gaps in the available data.

Exhibit Plan and Design — An exhibit plan and design would serve as a guide for developing exhibits that would support the national memorial's interpretive themes. The final production-ready exhibit plan would identify museum objects and graphics to be exhibited.

Carrying Capacity Analyses — The National Park Service has developed a visitor experience and resource protection (VERP) process for addressing carrying capacity. Rather than focusing on the number of cars that can fit into a parking area, the VERP process defines the type and levels of visitor use that can be accommodated while maintaining the desired resource and social conditions that would complement the purposes of the national memorial.

Ethnographic Landscape Study and Ethnographic Resource Inventory — A field study is needed to identify and describe the names, locations, distributions, and meanings of ethnographic landscape features.

For implementing the approved plan, archaeological and ethnographic surveys might be required. This would be determined individually when planning for construction was funded and undertaken.

Shuttle System Feasibility Study — If the option to undertake a shuttle service is decided on at some future point, a feasibility study would be conducted to establish the need for and economic feasibility of such a system. The feasibility study would also identify the most appropriate approach to shuttle system operations and maintenance, such as by the National Park Service or a concessioner.

ALTERNATIVES CONSIDERED BUT REJECTED

During the scoping phase of this project, some suggestions were made that have been dropped from further consideration. These were to pave the Montezuma Pass road and to provide for camping in the Coronado National Memorial.

The paving of the Montezuma Pass road would have been a costly project, would have caused considerable damage to memorial resources, and would have resulted in an adverse impact on the views from Montezuma Pass. A preliminary engineering assessment of the unpaved portion of the Montezuma Canyon road indicated that paving would have necessitated widening the road to 20 feet to accommodate two- way traffic. One option

considered was to achieve a minimum 20 miles per hour driving speed; another option looked at maintaining the existing alignment but not achieving a 20 mph speed. Both of these options would have been costly, would have increased accident hazards associated with increased driving speed, and would have resulted in more visual and resource impacts. This action, which would have been contrary to the memorial's purpose, was dropped from further consideration.

Adequate camping for memorial visitors is available outside the national memorial, and in- memorial camping facilities are not necessary to accomplish the memorial's mission.

THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in section 101 of the National Environmental Policy Act. In the National Park Service, the environmentally preferable alternative is identified by (1) determining how each alternative would meet the criteria set forth in section 101(b) and (2) considering any inconsistencies between the alternatives analyzed and other environmental laws and policies (Director's Order 12, 2.7.E).

Alternative B, which has been selected as the preferred alternative, is also the environmentally preferable alternative for Coronado National Memorial. The criteria listed in the National Environmental Policy Act are as follows:

- ★ Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
- ★ Ensure safe, healthful, productive, and esthetically and culturally pleasing surroundings for all Americans.
- ★ Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
- ★ Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and a variety of individual choices.
- ★ Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
- ★ Enhance the quality of renewable resources and approach the maximum

attainable recycling of depletable resources.

Alternative B rated high in all those categories, and it would best meet the requirements of other environmental laws and policies. Implementing alternative B would enhance the ability of Coronado National Memorial to carry out its mission through developmental and programmatic activities while limiting the impacts on the environment from any development. This would be accomplished because the existing developmental footprint would be used, and new development would be limited primarily to previously disturbed areas. Alternatives D and E, although they would enhance the visitor experience, would involve substantially more development and construction in previously undisturbed areas. Alternatives A and C would not entail new development in previously undisturbed areas, but they would not offer the diversity of individual choices available under alternative B.

Table 7 shows how each alternative would or would not fulfill the requirements of sections 101 and 102(1) of the National Environmental Policy Act. Although all the alternatives in this plan rated well (which is not surprising, since elements that were not environmentally sound were eliminated from consideration), it was found that alternative B would best protect, preserve, and enhance the historic, cultural, and natural resources of the national memorial. It also would "create and maintain conditions under which man and nature can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations of Americans" (from section 101).

TABLE 7: ENVIRONMENTALLY PREFERRED ALTERNATIVE ANALYSIS

Criterion	Alternative				
	A	B	C	D	E
Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.	1	2	1	1	2
Ensure safe, healthful, productive, and esthetically and culturally pleasing surroundings for all Americans.	2	2	2	2	2
Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.	1	2	1	2	1
Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and a variety of individual choices.	2	2	1	2	1
Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.	2	2	2	2	1
Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.	1	2	1	1	1
Total points 2 points for high (alternative fully meets the criterion) 1 point for moderate (alternative partially meets the criterion) 0 points for low (alternative does not meet the criterion)	9	12	8	10	8

TABLE 8: COMPARISON OF ALTERNATIVES

Alternative A: Existing Management Direction (No Action)	Alternative B: Enhance Opportunities while Protecting Resources (Preferred Alternative)	Alternative C: Focus on Resource Protection While Fulfilling Memorial's Mission	Alternative D: Create an International Experience for Visitors	Alternative E: Enhance Interpretation and the Efficiency of Operations
<u>Concept</u>				
Continue current management direction.	Enhance educational, recreational opportunities while ensuring public understanding of national memorial's resources; develop new ways for public to appreciate and understand the resources; emphasize educational and interpretive goals through multiple uses.	Enhance conservation and preservation of cultural and natural resources for future generations; minimize intrusive features on memorial's landscape; update interpretive media and make outreach more assertive.	Develop a fuller international experience for visitors; find new ways for public to appreciate and understand international aspects of memorial.	Offer enhanced visitor experience while making memorial more sustainable; seek new ways to educate public about significance of Coronado Expedition.
<u>Conservation Prescription</u>				
No management prescriptions in this alternative.	Includes all lands not in other prescriptions; retain all existing trails; develop four new trails, one of which would be in grasslands south of main road; do some restoration and revegetation to more natural state.	Includes all lands not in other prescriptions; restore abandoned roads to natural contours and revegetate with native species; study feasibility of reintroducing plants and animals present during Coronado Expedition.	Includes all lands not in other prescriptions; restore and revegetate abandoned roads in memorial.	Includes all lands not in other prescriptions; Montezuma Ranch (see below); East Forest Lane (see below).
GRAZING				
Continue managing grazing in both allotments according to <i>Livestock Management Plan</i> ; eventually retire one or both allotments if permittees willing.	No grazing in the memorial.	Same as alternative B.	Continue grazing in Joe's Spring allotment; manage according to <i>Livestock Management Plan</i> .	Continue grazing in Montezuma allotment; manage according to <i>Livestock Management Plan</i> .
ABANDONED POWERLINE ALONG MONTEZUMA PASS ROAD				
Allow powerline to deteriorate; if any section becomes a hazard, remove that portion.	Remove and revegetate with native species.	Same as alternative B.	Same as alternative B.	Same as alternative B.

Alternative A: Existing Management Direction (No Action)	Alternative B: Enhance Opportunities while Protecting Resources (Preferred Alternative)	Alternative C: Focus on Resource Protection While Fulfilling Memorial's Mission	Alternative D: Create an International Experience for Visitors	Alternative E: Enhance Interpretation and the Efficiency of Operations
<i>Education Prescription</i>				
No management prescriptions in this alternative.	Comprises trail from Montezuma Pass to Coronado Peak, trail to Coronado Cave, grasslands north and south of main road; interpret resources more intensively in those areas.	Encompasses trail from Montezuma Pass to Coronado Peak, trail to Coronado Cave; resources more intensively interpreted in those areas.	Includes trail from Montezuma Pass to Coronado Peak (interpretive media there rehabilitated and updated), trail to Coronado Cave, grasslands north of main road; NPS would explore feasibility of making part of trail to Coronado Peak accessible for people with disabilities; Coronado trail's interpretive media improved; new interpretive trail added north of road in grassland, possibly using Windmill Road, but not in Joe's Spring allotment.	Comprises trail from Montezuma Pass to Coronado Peak, trail to Coronado Cave (interpretive media on those trails rehabilitated and updated); grasslands north of main road; new interpretive trail at new visitor and educational center; another new trail from old visitor center to new visitor and educational center.
MONTEZUMA RANCH				
Evaluate ranch for national register eligibility; if eligible, preserve contributing features and let noncontributing features deteriorate; remove any safety hazards.	Ranch would be in conservation prescription in alternative B. Evaluate ranch for national register eligibility; if eligible, consult with Arizona state historic preservation office about how to document eligible features; then eliminate structures, restore natural contours, and revegetate with native species.	Ranch would be in conservation prescription in alternative C; manage same as in alternative B.	Ranch would be in visitor services prescription in alternative D; evaluate for national register eligibility as in alternative B; educational center would be in ranch area either in adapted structures or in new structures.	Ranch would be in conservation prescription in alternative E; evaluate for national register eligibility as in alternative B, then remove structures, restore natural contours, and revegetate with native species.
EAST FOREST LANE				
No change in use of East Forest Lane.	Ranch and East Forest Lane would be in conservation prescription . Continue using for NPS purposes and grazing access; when not needed and grazing ended, revegetate with native species.	East Forest Lane would be in conservation prescription ; it and other abandoned roads in memorial restored to natural contours and revegetated to make larger area of unbroken wildlife habitat.	Part of East Forest Lane in education prescription ; rest in visitor services prescription ; upgrade from dirt to a paved two-lane road; build a structure to commemorate Coronado Expedition.	East Forest Lane in conservation prescription ; would continue to be used for NPS operations and Montezuma allotment access.

Alternative A: Existing Management Direction (No Action)	Alternative B: Enhance Opportunities while Protecting Resources (Preferred Alternative)	Alternative C: Focus on Resource Protection While Fulfilling Memorial's Mission	Alternative D: Create an International Experience for Visitors	Alternative E: Enhance Interpretation and the Efficiency of Operations
TRAILS				
No change in trails.	Develop a trail accessible to mobility impaired visitors, using part of Windmill Road and a road in Montezuma Ranch area; develop a loop trail in this area; also develop a loop trail in grasslands south of main memorial road; minimal developments on trailheads (possibly restrooms); determine if trail from Montezuma Pass to Coronado Peak can be made accessible; rehabilitate and update interpretive media on that trail. Remove interpretive trail near visitor center to accommodate annex; make new trail near current picnic area.	Only changes on trail from Montezuma Pass to Coronado Peak and trail to Coronado Cave would be more intensive interpretation, as mentioned above. Upgrade interpretive trail near visitor center and make it accessible for visitors with disabilities.	Build a new interpretive trail north of main road, possibly using Windmill Road; but not in Joe's Spring allotment; find out if trail from Montezuma Pass to Coronado Peak can be made accessible; rehabilitate and update that trail's interpretive media. Remove interpretive trail at visitor center.	Rehabilitate and update interpretive media on trails to Coronado Peak and Coronado Cave to explain memorial's purpose and resources better; develop new interpretive trail at new visitor/ educational center to interpret grasslands; add another trail between old visitor center and new visitor/ educational center. Retain interpretive trail at visitor center as it is.
<u>Visitor Services Prescription</u>				
No management prescriptions in this alternative.	Encompasses area around visitor center, parking area at top of Montezuma Pass, and main memorial road.	Encompasses area around visitor center, parking area at top of Montezuma Pass, and main memorial road.	Includes area around visitor center, picnic area, parking at top of Montezuma Pass, East Forest Lane from main road to border, Montezuma Ranch area, main memorial road.	Comprises area for new visitor and educational center, present visitor center, picnic area, parking area at top of Montezuma Pass, main memorial road, part of Windmill Road.
ACTIONS NEAR VISITOR CENTER				
No change in parking.	Develop parking area for up to 4 buses or RVs and 6 cars; develop new group site at former fiesta area.	Develop parking area for up to 4 buses or RVs and 6 cars; restore former fiesta area and social trails to natural contours and revegetate.	Add parking (some in current picnic area) upgrade road to picnic area; add picnic sites in former fiesta area.	No change in parking area at current visitor center.

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MAIN MEMORIAL ROAD				
No change in main road.	Develop up to three new pullouts and waysides; expand pullout near end of paved road for a few picnic tables and place for visitors to see views.	No change in main road.	Add a few picnic tables and a wayside exhibit to pullout near end of main memorial road.	No change in main road.
<i>Operations / Special Use Prescription</i>				
No management prescriptions in this alternative.	Includes staff housing, maintenance, private inholdings, utility corridor.	Includes staff housing, maintenance, private inholdings, utility corridor.	Includes staff housing, maintenance, private inholdings, utility corridor.	Includes staff housing, maintenance, private inholdings, utility corridor.
HOUSING AREA				
No change in housing.	No change, but option to build a 4- unit structure to house people working temporarily at memorial; retain two trailer pads; screen all development from road with vegetation.	Same as alternative B.	Same as alternative B.	Same as alternative B.
<i>Partnerships, Programs, and Activities</i>				
INTERNATIONAL OUTREACH				
No change.	Memorial would support creation of, but not be chief sponsor of, an offsite festival to celebrate various cultures associated with memorial; historical aspects of Coronado Expedition emphasized; staff would work with Mexican organizations to develop interpretive programs and activities to support Mexican and American cultural and natural resources.	NPS would work with Mexican groups and organizations to develop interpretive programs and activities that would support Mexican and American cultural and natural resources.	Explore feasibility of sponsoring (at various universities) Coronado-related events such as lectures and cultural activities onsite or offsite; emphasize themes related to international aspects of national memorial at visitor center, educational center, and commemorative feature.	Same as alternative C.

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ENCOURAGING UNDERSTANDING					
No change.		To help people understand memorial's story, NPS would work separately or with others to promote special events inside and outside memorial such as programs about Coronado Expedition's legacy and impact on American Southwest; NPS would expand work with others to preserve regional ecosystem.	For better public understanding of its mission, memorial would emphasize reaching beyond boundaries and working with various groups to tell its story; could include partnerships with schools (elementary to university), Forest Service, BLM.	Develop hiking and horseback trail parallel to East Forest Lane that would exit toward San Pedro River.	Equal emphasis on all interpretive themes; strongly emphasize working with groups to reach beyond boundaries to tell story; could include partnerships with schools (elementary to university), Forest Service, BLM; recommend that Coronado National Forest's developing trail enter memorial from east, ending at new visitor/educational center.
<u>Implementation</u>					
STAFFING					
Current FTE of 12.		Current 12 FTE, plus 9.5 more FTE needed for primary priority actions; total 21.5 FTE.	Existing 12 FTE, plus 5 more FTE needed for primary priority actions; total 17 FTE.	Existing 12 FTE, plus 9.5 more FTE needed for primary priority actions; total 17 FTE.	Existing 12 FTE, plus 10 more FTE needed for primary priority actions; total 22 FTE.
COSTS					
Staff	\$740,000	\$1,179,000	\$966,000	\$1,208,000	\$1,239,000
Development	-0-	\$1,800,000-\$2,200,000	\$1,400,000-\$1,800,000	\$3,500,000-\$4,000,000	\$4,200,000-\$4,700,000

TABLE 9: COMPARISON OF EFFECTS OF THE ALTERNATIVES

Alternative A: Existing Management Direction (No Action)	Alternative B: Enhance Opportunities While Protecting Resources (Preferred)	Alternative C: Focus on Resource Protection and Fulfill Memorial's Mission	Alternative D: Create an International Experience for Visitors to National Memorial	Alternative E: Enhance Interpretation and the Efficiency of Operations
<i>Natural Resources</i>				
AIR QUALITY				
Alternative A would result in no measurable effects on the air quality at the memorial.	The construction activities and increased traffic from more visitation in alternative B would cause negligible local short- term adverse effects on local air quality at the memorial but would not affect regional air quality.	The construction activities and increased traffic from more visitation in alternative C would cause negligible local short- term adverse effects on local air quality at the memorial but would not affect regional air quality.	The construction and revegetation of alternative D, along with more traffic generated by increased visitation, would cause short- term negligible to minor adverse effects on local air quality at Coronado National Memorial, but the actions of alternative D would not affect regional air quality.	The construction activities and increased traffic from more visitation in alternative E would cause negligible local short- term adverse effects on local air quality at the memorial but would not affect regional air quality.
CAVE RESOURCES				
Cave resources would continue to be impacted by visitors and time with the result of a long- term minor adverse effect.	There would be beneficial effects on Coronado Cave. The intensity of these effects would be difficult to quantify before the carrying capacity is determined, but the effects would be long term and probably would be negligible to minor.	Same as alternative B.	Same as alternative B.	Same as alternative B.
SOILS				
No expansion would be planned for the visitor center vicinity. Off- road parking (mainly during peak periods) and social trails would continue to compact soils.	Expanding the visitor center and adding parking, pullouts, and new trails and trailheads would affect less than 1 acre of soils, and mitigative measures would be used. These overall effects would be negligible to minor because of the small size of the area affected, the low erosion potential of the soils, and the implementation of mitigation measures.	The impacts on soil resources from development under alternative C, such as visitor parking and trails improvements, would be long term and negligible because of the limited amount of development, the small size of the area affected (less than 1 acre), and the low soil erosion potential of the areas affected. Mitigative measures would be used to minimize erosion and to limit construction activities to the immediate area.	Expanding the visitor center and adding picnic sites with low erosion potential would result in negligible to minor adverse effects on soils because these actions would take place in small previously disturbed areas. Mitigative measures would minimize erosion and limit construction to the immediate area.	Developing a new visitor center under alternative E would result in ground disturbance, which would cause local short- term and long- term adverse effects on soils. These effects would be negligible to minor because the area affected would be small and mitigating measures would be used. Paving roads, adding parking areas, and developing trails would result in short- term and long- term negligible to minor adverse effects on soils. Those short- term effects would diminish over time with the recovery of vegetation along the road.
Removing the Montezuma Ranch structures would result in negligible to minor short- term local adverse impacts on soils. Mitigating measures would be employed to avoid or reduce effects. Restoration of this site would offset any adverse effects and result in up to minor long- term benefits.	Removing the Montezuma Ranch structures would erode and compact soils. The local adverse impacts on soils would be short- term and negligible to minor because mitigative measures would be employed to minimize erosion and limit construction activities to the immediate area. The adverse effects would be offset by beneficial effects from restoring and revegetating the site, which would improve the ecosystem's health and integrity by reducing nonnative vegetation and increasing the number of native species, a negligible to minor long- term beneficial effect. This alternative would reduce soil compaction and increase permeability and soil retention, a long- term negligible to minor beneficial effect on soil resources.	Montezuma Ranch and other areas in the memorial would be restored and revegetated under alternative C than under the other alternatives. Restoring sites would improve soil properties by reducing soil compaction and increasing permeability, causing local long- term negligible to minor beneficial effects on soils.	The short- term and long- term adverse effects on soils from paving roads, developing parking areas and trails, and developing an educational center at Montezuma Ranch would be negligible to minor because the area affected would be small, and best management practices would be used to reduce soil impacts.	Removing the Montezuma Ranch structures would result in short- term negligible to minor adverse impacts on soils, which would be offset by long- term beneficial effects from restoring and revegetating the site, which would improve soils by reducing compaction and increasing permeability. This would result in local long- term negligible to minor beneficial effects.

Alternative A: Existing Management Direction (No Action)	Alternative B: Enhance Opportunities While Protecting Resources (Preferred)	Alternative C: Focus on Resource Protection and Fulfill Memorial's Mission	Alternative D: Create an International Experience for Visitors to National Memorial	Alternative E: Enhance Interpretation and the Efficiency of Operations
No new employee housing would be developed.	The development of new employee housing would result in long- term negligible to minor adverse effects on soils, and mitigation measures would be employed to reduce erosion. Programs to interpret, document, and inventory memorial resources and uses would result in long- term negligible benefits to soils in the memorial.	Same as alternative B.	Same as alternative B.	Same as alternative B.
The effects on soils from continued grazing on the allotments would be reduced through an adaptive management approach that would monitor impacts on soils and vegetation and adjust the number of livestock accordingly. Erosion and compaction caused by continuing grazing on both allotments would result in minor adverse impacts on soils.	Eliminating grazing from the memorial would result in long- term minor beneficial effects on soils by reducing nonnative species and reestablishing native vegetation. Overall, the beneficial effects of this alternative would offset any adverse impacts associated with development.	Ending grazing in the memorial would have a long- term minor beneficial effect on soils because nonnative vegetative species would be reduced and native vegetation would increase. Overall, the beneficial effects of alternative C would offset any adverse impacts associated with the limited development.	Continuing grazing in the Joe's Spring allotment would result in minor long- term adverse impacts on soils, but they would be offset by eliminating grazing from the Montezuma allotment.	Continuing grazing in the Montezuma allotment (14% of the national memorial) would result in minor long- term adverse Impacts on soils, but they would be offset by eliminating grazing from the Joe's Spring allotment.
VEGETATION				
No expansion would be planned for the visitor center vicinity. Off- road parking (mainly during peak periods) and social trails would continue to impact vegetation.	Expanding the visitor center and adding parking, pullouts, and trailheads would affect less than 1 acre of vegetation, and mitigative measures would be used. The impacts would be negligible to minor because of the small size of the area affected, the low erosion potential of the soils, and the use of mitigation.	Adding more visitor parking would result in long- term negligible effects on vegetation because the development would be limited and the area affected would be less than 1 acre. Mitigative measures would be used to minimize erosion and to limit construction activities to the immediate area.	Expanding the visitor center and adding picnic sites with low erosion potential would result in negligible to minor adverse effects on vegetation because these actions would take place in previously disturbed areas and the areas would be small. Mitigative measures would minimize erosion and limit construction activities to the immediate area.	Developing a new visitor center would cause ground disturbance, which would lead to local short- term and long- term adverse effects on vegetation. These effects would be negligible to minor because the area affected would be small and mitigating measures would be used. Paving roads, adding parking areas, and developing trails would result in short- term and long- term negligible to minor adverse impacts on grassland vegetation. Those short- term effects would diminish over time as vegetation along the road recovered.
No new employee housing would be developed.	The development of new employee housing would result in long- term negligible to minor adverse effects on vegetation, and mitigation measures would be employed. Programs to interpret, document, and inventory memorial resources and uses would result in long- term negligible benefits to vegetation in the memorial.	Same as alternative B.	Same as alternative B.	Same as alternative B.
Removing the Montezuma Ranch structures would result in negligible to minor adverse short- term local impacts on vegetation. Mitigating measures would be used to avoid or reduce effects. Restoration and revegetation with native species would have a long- term negligible to minor beneficial effect.	Removing the Montezuma Ranch structures would result in local adverse impacts on vegetation, which would be short term and negligible to minor because mitigative measures would be used to minimize soil erosion, limit construction activities to the immediate area, and accelerate restoration of native plant species. The adverse effects would be offset by beneficial effects from restoring and revegetating the site, which would improve the ecosystem's health and integrity by reducing nonnative vegetation and increasing the number of native species, a negligible to minor long- term beneficial effect.	More areas in the memorial would be restored and revegetated under alternative C than under the other alternatives. The impacts from development under alternative C would be long term and negligible because of the limited amount of development and the small size of the area affected (less than 1 acre). Restoring sites would improve ecosystem health and integrity by reducing nonnative species and reestablishing native plant species, a long- term local negligible to minor beneficial effect on vegetation.	Individual plants would be trampled and uprooted during the paving of roads and parking areas and the development of trails. The short- term and long- term adverse impacts on vegetation from paving roads, developing parking areas and trails, and developing an educational center would be negligible to minor because the area affected would be small and best management practices would be used to reduce impacts. Only the vegetation in the area adjacent to the development would be affected. The adverse effects would diminish over time as the area revegetated.	Removing the Montezuma Ranch structures would result in short- term negligible to minor adverse impacts on vegetation. This would be offset by long- term beneficial effects from re- storing and revegetating the site, which would reduce compaction and increase permeability, resulting in local long- term negligible to minor beneficial effects.

Alternative A: Existing Management Direction (No Action)	Alternative B: Enhance Opportunities While Protecting Resources (Preferred)	Alternative C: Focus on Resource Protection and Fulfill Memorial's Mission	Alternative D: Create an International Experience for Visitors to National Memorial	Alternative E: Enhance Interpretation and the Efficiency of Operations
The impacts on vegetation from continued grazing in the allotments is being reduced through an adaptive management approach that monitors the impacts on vegetation and adjusts the number of livestock accordingly. Minor adverse impacts on vegetation, including riparian vegetation, and range condition would result from erosion and compaction caused by continuing grazing on both allotments. However, modifying grazing management according to the <i>Livestock Management Plan</i> will improve range conditions compared to those that existed before the plan was implemented.	Ending grazing in the memorial would result in long- term minor beneficial effects on vegetative communities and range condition by reducing nonnative species and reestablishing native vegetation. Overall, the beneficial effects of this alternative would offset any adverse impacts associated with development.	Eliminating grazing from the memorial would have a long-term minor beneficial effect on vegetation and range condition because nonnative vegetative species would be reduced and native vegetation would increase. Overall, the beneficial effects of this alternative would offset any adverse impacts associated with the limited development.	Grazing in the Joe's Spring allotment would continue to adversely affect vegetation in the memorial, but the minor long- term adverse effects would be offset by the beneficial effects from ending grazing in the Montezuma allotment.	Continuing grazing in the Montezuma allotment (14% of the memorial) would result in minor long- term adverse impacts on vegetation, but they would be offset by eliminating grazing from the Joe's Spring allotment.
THREATENED, ENDANGERED, AND SENSITIVE SPECIES				
Programs to interpret, document, and inventory memorial resources and uses would result in a long- term negligible benefits to threatened and endangered or sensitive species in the memorial.	Enhanced programs to interpret, document, and inventory memorial resources and uses would result in a long- term negligible benefits to threatened and endangered or sensitive species in the memorial.	Same as alternative B.	Same as alternative B.	Same as alternative B.
Current maintenance and operations activities would continue to have a negligible impact on wildlife.	<p>Enlarging the visitor center and adding trails, parking areas, and pullouts would cause indirect effects on lesser long- nosed bats, Mexican long- tongued bats, and loggerhead shrikes by disturbing vegetation and small mammals that are food sources for the shrikes. The developments would not measurably affect the population of agaves, a food source for the lesser long- nosed bat and the Mexican long- tongued bat, nor would it alter the populations of small mammals in grassland habitats, which are the prey base of loggerhead shrikes.</p> <p>The development activity near the visitor center would occur in pine- oak- juniper forests that is primary foraging habitat of the Mexican spotted owl. These actions would take place in areas previously disturbed and frequently used by visitors. The owls often avoid those areas. The developments in owl foraging habitat outside the protected activity center would be short- term, indirect, and negligible and would not be not likely to adversely affect the species.</p>	<p>Adding parking for buses and recreational vehicles would not affect the long- nosed bat, the Mexican long- tongued bat or the loggerhead shrike because these actions would not take place in the grassland areas of the memorial, where the predominant forage for these species is found. The developments would be placed in owl foraging habitat outside the protected activity centers, and they would be in areas already used by visitors, so it is likely that the owls avoid these areas when foraging. Therefore, the effects from the developments would be short- term, indirect, and negligible, and these species would not be likely to be adversely affected.</p> <p>Removing powerlines in the proposed protected activity center for the Mexican spotted owl at a time not in the owl's breeding season might cause the owls to avoid the area when foraging but it would not adversely affect the species.</p>	<p>The development- related activities of alternative D north of the main memorial road would not alter the population of agave plants, which are the food source of the lesser long- nosed and Mexican long- tongued bats. However, individual plants might be disturbed by building trails in grasslands or by paving roads and parking areas. These activities would not alter the populations of small mammals and reptiles that are the prey base of the loggerhead shrike There might be indirect negligible effects, but it is not likely that there would be adverse effects on these species.</p> <p>The developments north of the main memorial road would not be in prime Mexican spotted owl foraging or nesting habitat, and the availability of the owl's prey species in this area is low. Therefore, the developments of alternative D would not be likely to adversely affect the Mexican spotted owl.</p>	<p>The ground- disturbing activities of developing buildings and trails and more road access into grasslands north of the main road would disturb vegetation and small mammals and reptiles. This would indirectly affect the lesser long- nosed bat, the Mexican long- tongued bat, and the loggerhead shrike, but it is unlikely that these species would be adversely affected.</p> <p>The activities and developments of alternative E would take place in areas unsuited for Mexican spotted owl nesting and foraging habitat; therefore, implementing alternative E might affect, but would be unlikely to adversely affect, the Mexican spotted owl.</p>

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Removing the Montezuma Ranch structures would disturb a small area, and the effects would be short-term and local, causing negligible to minor adverse effects on the populations of either agaves that are a food source for nectar- feeding bats or small mammals that are prey for the loggerhead shrike. The adverse effects to listed species would be negligible. The ranch area is not in prime foraging or nesting habitat for the Mexican spotted owl, and there is low availability of the owl's prey species in this location; therefore, removing the ranch structures would not adversely affect these owls.	Removing the Montezuma Ranch structures would disturb about 25 acres (less than 1% of the memorial's acreage), causing negligible to minor adverse effects on the food base of the lesser long- nosed bat, the Mexican long- tongued bat, and the loggerhead shrike. Therefore, removing the structures might indirectly affect but would not be likely to adversely affect those listed or sensitive species. The ranch area is not in prime foraging or nesting habitat for the Mexican spotted owl, and there is low availability of the owl's prey species in this location; therefore, removing the ranch structures would not be likely to adversely affect this species.	Removing the Montezuma Ranch structures would disturb a small area and might result in the loss of individual agave plants, the food base of the lesser long- nosed and Mexican long- tongued bat. The action also might displace prey species of the loggerhead shrike. Therefore, removing the structures might indirectly affect but would not be likely to adversely affect these listed or sensitive species. The ranch area is not in prime foraging or nesting habitat for the Mexican spotted owl, and there is low availability of the owl's prey species in this location; therefore, removing the ranch structures would not be likely to adversely affect the Mexican spotted owl.	Adapting the Montezuma Ranch structures for use as an educational center or removing them and building new buildings would disturb agave plants and small mammals that are food sources for loggerhead shrikes, lesser long- nosed bats, and Mexican long- tongued bats, resulting in negligible to minor indirect effects on these species. Adapting the structures would not be likely to adversely affect these species.	Removing the Montezuma Ranch structures and restoring and revegetating the area would result in more habitat for agave plants and more ground cover and habitat for small rodent species. This would indirectly benefit nectar- feeding bats and loggerhead shrikes by increasing their available food.
Restoring and revegetating the ranch area might result in more agave plants, increasing the available food for nectar- feeding bats. Revegetating the area probably would increase the habitat and prey species of the loggerhead shrikes. Thus, there would be beneficial effects on the lesser long- nosed bat, the Mexican long- tongued bat, and the loggerhead shrike, and the restoration would not be likely to adversely affect these species. Because of the small portion of the national memorial affected, this alternative might affect the lesser long- nosed and Mexican long- tongued bat and the loggerhead shrike but would not be likely to adversely affect these species.	Restoring and revegetating the ranch area after removing the structures might increase the number of agave plants, resulting in more available food for nectar- feeding bats. Revegetating the area probably would increase the habitat and prey species of the loggerhead shrikes. Thus, there would be beneficial effects on the lesser long- nosed and Mexican long- tongued bat and the loggerhead shrike, and the restoration would not be likely to adversely affect these species. Because only a small part the memorial would be affected, this alternative might affect the lesser long- nosed and Mexican long- tongued bats and the loggerhead shrike but would not be likely to adversely affect these species.	Same as alternative B	Restoring and revegetating the ranch area after the area is developed as an educational center would result in about the same number of agave plants as currently. Revegetation of the area probably would maintain the habitat and prey species of the loggerhead shrikes. Thus there would be long- term, negligible effects on these species.	Same as alternative B.
It is unlikely that Mexican spotted owls use the grazing allotments. Continued grazing in the memorial under alternative A, with the use of the <i>Livestock Management Plan</i> , would not be likely to adversely affect this species.	It is unlikely that Mexican spotted owls use the grazing allotments; therefore discontinuing grazing would not likely affect these owls.	Same as alternative B.	It is unlikely that Mexican spotted owls use the grazing allotments. Therefore, gazing associated with this alternative would not be likely to adversely affect this species.	It is unlikely that Mexican spotted owls use the grazing allotments. Therefore, gazing associated with this alternative would not be likely to adversely affect this species.
Alternative A also would not be likely to adversely affect the endangered lesser long- nosed bat.	Alternative B would not be likely to adversely affect the endangered lesser long- nosed bat.	Ending grazing in the memorial would have a negligible effect on nectar- feeding bats but would not be likely to adversely affect these species	Grazing associated with alternative D would have a negligible effect on nectar- feeding bats and would not be likely to adversely affect the lesser long- nosed bat.	Continuing grazing in the Montezuma allotment would continue negligible to minor adverse effects on vegetation and wildlife on which listed or sensitive species rely for food and habitat. Implementing alternative E would not be likely to adversely affect the lesser long- nosed bat.
Livestock grazing in the memorial under alternative A might adversely affect the loggerhead shrike by adversely affecting prey habitat for species that the loggerhead shrike relies on. These effects would be negligible.	Eliminating grazing from the memorial might increase the prey base and nesting habitat for loggerhead shrike. It would have a negligible effect on the lesser long- nosed and Mexican long- tongued bat.	Ending grazing in the memorial might increase the prey base and nesting habitat for loggerhead shrikes.	Continued grazing on the Joe's Spring allotment would disturb the food sources of the loggerhead shrike, indirectly affecting this species.	Continuing grazing in the Montezuma allotment would continue negligible to minor adverse effects on vegetation and wildlife on which listed or sensitive species rely for food and habitat.

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WATER QUALITY				
No new employee housing would be developed.	No adverse effects on water quality would be anticipated from developing additional employee housing. The establishment of monitoring programs in the memorial to monitor activities such as grazing would benefit overall water quality in the memorial.	Same as alternative B.	Same as alternative B.	Same as alternative B.
Current memorial maintenance and operation actions would continue to result in a gradual, long-term beneficial impact on the memorial's water quality.	Adding an annex to the visitor center and developing new parking, pullouts and trailheads would affect less than 1 acre, resulting in long- term negligible to minor adverse impacts on water quality. Mitigative measures would be used to reduce soil erosion and the loss of vegetation along streams.	The effects on water quality from adding a few more parking spaces in an existing footprint would be negligible because the area affected would be small, the actions would not take place in riparian habitat or adjacent to a stream channel, and mitigating measures would be used to reduce impacts.	Expanding the visitor center and adding picnic sites in previously disturbed areas would result in negligible to minor effects on water quality because the development would not take place in riparian habitat or near drainages. Mitigating measures would minimize erosion and limit construction to the immediate area.	The long- term effects on water quality from developing a new visitor center would be negligible because the development would not take place in a riparian area or along drainages, and mitigative measures would reduce soil erosion.
Removing the Montezuma Ranch structures would not measurably affect water quality because the action would not be near drainages, and mitigative measures would be used to contain or reduce soil erosion. Restoration of the site would offset any adverse effects of the removal.	Removing the Montezuma Ranch structures and restoring and revegetating the area would have negligible effects on water quality. Restoring East Forest Lane and the site where powerlines would be removed would restore native riparian vegetation, reducing soil erosion and sedimentation. The long- term beneficial effects on water quality from those activities would be negligible to minor.	Removing the Montezuma Ranch structures and restoring and revegetating the area would have negligible effects on water quality. Restoring and revegetating more sites than in the other action alternatives would result in negligible to minor improvements in water quality by reducing sedimentation into drainages. Ending grazing in the memorial would result in a long- term minor beneficial effect on water quality. Overall, the beneficial effects of alternative C on water quality would offset any adverse impacts associated with the limited development.	Removing the Montezuma Ranch structures and replacing them with new buildings or adapting them for use as an educational center would not affect water quality. Paving East Forest Lane and developing trails would result in short- term minor adverse impacts on water quality because construction would increase soil erosion and sedimentation. The long- term impacts would be negligible because riparian vegetation would recover along the streambank.	Removing the Montezuma Ranch structures and restoring and revegetating the area would result in negligible long- term beneficial effects on water quality. Paving Windmill Road would result in minor long- term adverse impacts on water quality because the amount of stream channel affected would be small. Road and trail development would result in negligible to minor long- term adverse impacts on water quality.
Reducing livestock numbers consistent with the <i>Livestock Management Plan</i> is improving water quality by reducing sedimentation, fecal coliform, and other microbes, but grazing, even at reduced levels, would continue to degrade watersheds, This would cause soil erosion, decrease plant cover, and alter plant communities. The long- term adverse effects on water quality from continued grazing would be minor.	Ending grazing in the memorial would improve water quality by decreasing sedimentation and reducing fecal coliform and other microbes, a long- term minor beneficial effect on riparian habitats and water quality. Overall, the beneficial effects on water quality from this alternative would offset any adverse impacts associated with development.	Same as alternative B.	Continuing grazing in the Joe's Spring allotment would continue to affect water quality adversely through continued streambank erosion and sedimentation, but ending grazing in the Montezuma allotment would offset these effects.	Continuing grazing in the Montezuma allotment would result in minor long- term adverse impacts on riparian habitats and consequently on water quality, but the effects would be offset by eliminating grazing in the Joe's Spring allotment.
WILDLIFE				
	Programs to interpret, document, and inventory memorial resources and uses would result in a long- term negligible benefits on threatened and endangered or sensitive species in the memorial. Loss of a small portion of wildlife habitat and the potential for loss of sedentary individual animals from development of new employee housing would have long- term negligible to minor adverse effects.	Same as alternative B.	Same as alternative B.	Same as alternative B.

Alternative A: Existing Management Direction (No Action)	Alternative B: Enhance Opportunities While Protecting Resources (Preferred)	Alternative C: Focus on Resource Protection and Fulfill Memorial's Mission	Alternative D: Create an International Experience for Visitors to National Memorial	Alternative E: Enhance Interpretation and the Efficiency of Operations
<p>Removing the Montezuma Ranch structures and restoring and revegetating the area would result in more ground cover and habitat for small rodent species. The structure removal would cause short-term negligible adverse effects on wildlife. Mitigating measures would be used to prevent or reduce the effects on rare or uncommon wildlife species. Restoring and revegetating the site with native vegetation after the structures were removed would offset the adverse impacts on soils and improve grassland habitat, benefiting wildlife species.</p> <p>Ongoing implementation of the <i>Livestock Management Plan</i> is improving wildlife habitat in the two allotments. However, continued grazing in the national memorial would result in minor long-term adverse impacts on some wildlife species from habitat loss and forage reduction.</p>	<p>Expanding the visitor center and building trails would result in more public access to wildlife habitat, resulting in negligible to minor adverse effects. Trails and roads might benefit some species by facilitating movement.</p> <p>Removing the Montezuma Ranch structures, with mitigating measures to reduce impacts on rare or uncommon species, would result in long-term negligible adverse effects on wildlife. Restoring the ranch area to natural contours and revegetating it would improve grassland habitat, resulting in a long-term negligible to minor benefit for wildlife species. Ending grazing in the national memorial would improve habitat and forage, benefiting wildlife.</p>	<p>Adding parking for buses and recreational vehicles would result in negligible effects on wildlife in the memorial. The long-term adverse effects on wildlife from removing the Montezuma Ranch structures would be negligible with the implementation of mitigating measures to reduce impacts on rare or uncommon species. Restoring and revegetating areas in the memorial would improve grassland habitat, benefiting wildlife species. Ending grazing in the memorial would improve habitat and forage, a long-term minor beneficial effect on wildlife.</p>	<p>The adverse effects on wildlife from expanding the visitor center and adding picnic sites in previously disturbed areas would be negligible to minor. Removing the Montezuma Ranch structures and using mitigative measures to reduce impacts on rare or uncommon species would result in long-term negligible adverse effects on wildlife. Developing trails in the memorial would result in short-term adverse effects on wildlife, but the effects would be negligible to minor because the areas affected would be small. Trails and roads might benefit some species by facilitating movement.</p> <p>Widening and paving East Forest Lane road, with the resultant increased visitor access, would cause long-term minor adverse local effects on wildlife from increased potential for roadkill and the continued fragmentation of habitat. These actions also would degrade the value of the drainages as migration corridors. Ending grazing in the Montezuma allotment would increase grassland forage and improve riparian habitat, resulting in long-term minor beneficial effects for wildlife.</p>	<p>Developing buildings, trails, and roads under alternative E would result in the loss of habitat and individual animals and the fragmentation of populations. This represents a loss of habitat value, but because the affected grassland area would be small and does not contain uncommon species, the adverse effects on wildlife would be negligible. Trails and road development might benefit individuals of some species by facilitating movement.</p> <p>Removing the Montezuma Ranch structures, with mitigation to reduce the adverse effects on rare or uncommon species, would result in long-term negligible adverse effects on wildlife. Restoring and revegetating the ranch area would improve grassland habitat, benefiting wildlife. Eliminating grazing from the Joe's Spring allotment would increase forage and habitat in grassland and riparian areas, a long-term beneficial effect for wildlife.</p>
<u>Cultural Resources</u>				
ARCHEOLOGICAL RESOURCES				
<p>An archeological survey would be undertaken at the Montezuma Ranch. Research and resource documentation are improving the national memorial's ability to make informed management decisions. The ongoing efforts to identify and protect archeological resources would benefit archeological resources, but such resources would be adversely affected by the continuation of grazing. The overall result would be a long-term negligible adverse impact on the national memorial's archeological resources.</p>	<p>New development in the national memorial under alternative B would be minor, taking place primarily in previously disturbed areas. The impacts on archeological resources would be partially or fully mitigated by sensitive siting and by designing facilities in relation to the resources. Ending grazing in the national memorial would help to conserve archeological resources. Therefore, alternative B would result in a long-term negligible to minor beneficial effect on archeological resources.</p>	<p>Archeological resources probably would not be affected under alternative C, with development in the national memorial limited and most of it taking place in previously disturbed areas. Therefore, alternative C would result in long-term negligible to minor beneficial effects on archeological resources.</p>	<p>Much of the new development in Coronado National Memorial under alternative D would be limited to previously disturbed areas. The large number of ground-disturbing actions in this alternative would increase the possibility of affecting archeological resources. Overall, the actions of this alternative would result in a long-term negligible adverse impact on archeological resources.</p>	<p>Much of the new development in Coronado National Memorial under alternative E would take place in previously undisturbed areas. The variety of ground-disturbing actions in this alternative would increase the possibility of affecting archeological resources. Overall, the actions of this alternative would result in a long-term negligible to minor adverse impact on archeological resources.</p>
HISTORIC STRUCTURES				
<p>Before taking any action regarding the Montezuma Ranch structures, the national memorial staff would pursue a formal determination of the structures' eligibility for the National Register of Historic Places. Research and resource documentation are improving the national memorial's ability to make informed management decisions. The ongoing efforts to identify and preserve historic structures would benefit these resources. The overall result would be a long-term negligible to minor beneficial effect on the memorial's historic structures.</p>	<p>Before taking any action regarding the visitor center or the Montezuma Ranch structures, the national memorial staff would pursue a formal determination of the structures' eligibility for the National Register of Historic Places. Research and resource documentation are improving the national memorial's ability to make informed management decisions. The ongoing efforts to identify and preserve historic structures would benefit these resources. The overall result would be a long-term negligible beneficial effect on the national memorial's historic structures.</p>	<p>Before taking any action regarding the visitor center or the Montezuma Ranch structures, the national memorial staff would pursue a formal determination of the structures' eligibility for the National Register of Historic Places. Research and resource documentation are improving the national memorial's ability to make informed management decisions. The ongoing efforts to identify and preserve historic structures would benefit these resources. The overall result would be a long-term negligible beneficial effect on the national memorial's historic structures.</p>	<p>Before taking any action regarding the visitor center or the Montezuma Ranch structures, the national memorial staff would pursue a formal determination of the structures' eligibility for the National Register of Historic Places. Research and resource documentation are improving the national memorial's ability to make informed management decisions. The ongoing efforts to identify and preserve historic structures would benefit these resources. The overall result would be a long-term negligible beneficial effect on the national memorial's historic structures.</p>	<p>Research and resource documentation are improving the national memorial's ability to make informed management decisions. The ongoing efforts to identify and preserve historic structures would benefit these resources. The overall result would be a long-term negligible beneficial effect on the historic structures of the national memorial.</p>

Alternative A: Existing Management Direction (No Action)	Alternative B: Enhance Opportunities While Protecting Resources (Preferred)	Alternative C: Focus on Resource Protection and Fulfill Memorial's Mission	Alternative D: Create an International Experience for Visitors to National Memorial	Alternative E: Enhance Interpretation and the Efficiency of Operations
ETHNOGRAPHIC RESOURCES				
American Indians would continue gathering items important to their culture on the national memorial's lands. The long- term minor beneficial effect from developing inventories for ethnographic resources would be partially offset by a lack of in- depth programs, resulting in an overall long- term negligible beneficial effect on ethnographic resources.	No action or development in alternative B would affect known ethnographic resources. The various programs and partnerships that the national memorial would develop to emphasize the area's multicultural heritage would result in long- term moderate to major beneficial effects on ethnographic resources.	The lack of development in the form of trail, roads, and buildings in alternative C would protect the national memorial's ethnographic resources from disturbance. Restoring and revegetating areas of powerlines, roads, and nonhistoric structures would make more areas suitable for ethnographic use. All these actions combined would result in long- term negligible to minor beneficial effects on ethnographic resources.	The possibility of affecting ethnographic resources would be greater in alternative D than in some of the other alternatives because there would be greater access to areas of the national memorial. The actions in this alternative could result in a long- term negligible beneficial effect on ethnographic resources.	The possibility of adversely affecting ethnographic resources would be greater in alternative E than in some of the other alternatives because visitors would have more access to the grasslands in the national memorial. The actions of this alternative could have a long- term negligible adverse impact on ethnographic resources.
CULTURAL LANDSCAPES				
Until the Montezuma Ranch structures were removed, they would have short- term negligible adverse impacts on national memorial views. Development outside the national memorial could result in minor to moderate short- term and long- term adverse impacts on cultural landscapes.	The developments of alternative B would be minimal, and the impacts on cultural landscapes would be partially or fully mitigated by sensitive siting and design, augmented by other protective measures such as vegetative screening. This alternative would result in long- term minor to moderate beneficial effects on cultural landscapes.	The limited development proposed in alternative C would result in the restoration of landscapes to be representative of the time of the Coronado Expedition; therefore, this alternative would result in long- term negligible to minor beneficial effects on cultural landscapes.	The possibility of adversely affecting cultural landscapes would be greater in this alternative than in some of the other action alternatives because of the variety of actions (constructing roads, facilities, and trails) that would take place. The actions of alternative D would result in a long- term negligible adverse impact on cultural landscapes.	The possibility of adversely affecting cultural landscapes would be greater in this alternative than in some of the other action alternatives because of the variety of actions (constructing roads, facilities, and trails) that would take place. The actions of alternative E would result in a long- term negligible adverse impact on cultural landscapes.
<i>Visitor Understanding and Recreational Resources</i>				
Continuing the limitations on access to natural resources and cultural exhibits for mobility- impaired visitors along the memorial's trails would result in long- term negligible adverse impacts. If the demand for recreational resources continued to increase and no improvements were made, there would be local minor to moderate long- term adverse impacts on the visitor experience. Removing the Montezuma Ranch structures and restoring and revegetating the area would improve scenic values and the visitor experience from Montezuma Pass, resulting in a long- term minor beneficial effect on the visitor experience. Continued grazing in the memorial would have a long- term negligible to minor adverse impact on visitors wanting to hike in the allotments.	Improving recreational services and facilities in Coronado National Memorial would result in negligible to minor short- term and long- term beneficial effects on the visitor experience. The visitor experience also would be enhanced by resource conservation. Improving interpretive materials and expanding outreach programs that emphasize the memorial's mission, purpose, and significance would enhance the opportunities for visitors to learn about and understand the memorial's resources, a moderate long- term beneficial effect on the visitor experience. Eliminating grazing would enable visitors to experience the natural resources of the grass- lands, a negligible to minor beneficial effect on the visitor experience.	Under alternative C, access via memorial trails to natural resources and cultural exhibits for visitors with disabilities would continue to be limited, a negligible to minor adverse impact. Ending grazing in the memorial would enable some visitors to use grassland areas that have been little used for recreation; however, with no trails being developed in the allotment areas, the use would remain limited. Expanding the NPS facilities would result in short- term minor to moderate adverse impacts on the visitor experience, but in the long term there would be minor to moderate beneficial effects resulting from decreased congestion and improved views. Using outreach programs alone to emphasize the memorial's interpretive themes would result in only a minor beneficial effect on visitor understanding and the visitor experience.	Under alternative D, access via memorial trails to natural resources and cultural exhibits for visitors with disabilities would increase, resulting a negligible to minor beneficial effect. Expanding the visitor center would result in short- term minor to moderate impacts on the visitor experience, but visitor congestion would decrease as a result of the added developments, resulting in long- term moderate to major beneficial effects on the visitor experience. Improving interpretive materials and expanding the outreach programs that would emphasize the mission, purpose, and significance of the national memorial would enhance the opportunities for visitors to learn about and understand the memorial's resources, a moderate to major beneficial effect on the visitor experience. The new developments would affect the viewshed, resulting in long- term minor adverse impacts on the visitor experience. Eliminating grazing from the Montezuma allotment would benefit a small number of visitors who would use the trails in the grasslands, resulting in a negligible to minor beneficial effect on the visitor experience.	Under alternative E, access via memorial trails to natural resources and cultural exhibits for visitors with disabilities would increase, resulting in minor beneficial effects. The new, larger visitor/educational center would help to disperse visitors and alleviate congestion, a long- term moderate to major beneficial effect on visitor understanding and the visitor experience. Emphasizing the memorial's interpretive themes through outreach programs alone would result in a minor beneficial effect on the visitor experience. The new developments that would affect the viewshed would result in long- term negligible adverse impacts on the visitor experience. Eliminating grazing from the Joe's Spring allotment would benefit a small number of visitors, a negligible to minor beneficial effect on the visitor experience.
<i>Socioeconomic Environment</i>				
RECREATIONAL USE				
Recreational use at the national memorial under alternative A would be relatively small in proportion to the total recreational demand and recreational opportunities both in Cochise County and throughout the Southwest. The effects of this alternative on recreational use would be negligible both locally and regionally.	Alternative B, the preferred alternative, would result in moderate long- term beneficial effects on recreation by accommodating more recreation than alternative A.	Improvements in facilities and resource conservation brought about by implementing alternative C — increased recreation services, improved facilities, better controls, and enhanced visitor experience — would result in minor long- term beneficial effects on recreation.	Implementing alternative D, which would involve more recreational opportunities than alternative A, would result in moderate long- term beneficial effects on recreational use.	Alternative E would result in more recreation opportunities than would be available under alternative A; this would be a moderate long- term beneficial effect on recreational use.

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GRAZING				
The long- term effects of grazing on the socioeconomic environment under alternative A would be negligible.	Ending grazing in the national memorial would result in a negligible adverse effect on the county's economy from reduced cattle production.	Eliminating grazing in the national memorial would result in a negligible long- term adverse effect on the county's economy from reduced cattle production.	Eliminating grazing from the Montezuma allotment would result in a minor long- term beneficial effect on recreational use and a negligible adverse effect on the county's economy from reduced cattle production.	Ending grazing in the Joe's Spring allotment would cause a minor long- term beneficial effect on recreational use and a negligible adverse effect on the county's economy from reduced cattle production.
LOCAL AND REGIONAL ECONOMY				
New jobs and visitor spending associated with alternative A would have negligible effects on the economy. The ability to provide additional personnel trained in fighting wildland fires would be a minor long- term beneficial effect on the region.	Implementing alternative B would result in negligible beneficial effects on the economy of Cochise County compared to alternative A. These effects would result from the direct and indirect creation of local jobs, increased spending associated with more visitation, and expenditures on construction labor and supplies. Negligible adverse effects would result from decreased cattle production. The addition of NPS staff trained in wildland fire suppression would result in a minor long- term beneficial effect on wildland fire control in the county.	Implementing alternative C would result in negligible beneficial effects on the economy of Cochise County compared to alternative A. These effects would result from the direct and indirect creation of local jobs, increased spending associated with increased visitation, and expenditures on construction labor and supplies. Negligible adverse effects would result from decreased cattle production. The addition of NPS staff trained in wildland fire suppression would result in a minor long- term beneficial effect on wildland fire control in the county.	Implementing alternative D would result in negligible beneficial effects on the economy of Cochise County compared to alternative A. These effects would result from the direct and indirect creation of local jobs, increased spending associated with more visitation, and expenditures on construction labor and supplies. Negligible adverse effects would result from decreased cattle production. The addition of NPS staff trained in wildland fire suppression would result in a minor long- term beneficial effect on wildland fire control in the county.	Implementing alternative E would result in negligible beneficial effects on Cochise County's economy compared to alternative A. These effects would result from the direct and indirect creation of local jobs, increased spending associated with increased visitation, and expenditures on construction labor and supplies. Negligible adverse effects would result from decreased cattle production. The addition of NPS staff trained in wildland fire suppression would result in a minor long- term beneficial effect on wildland fire control in the county.

AFFECTED ENVIRONMENT



NATURAL RESOURCES

GENERAL DESCRIPTION

Coronado National Memorial is in the Sierra Madrean oak/woodlands transition zone at the interface of the Sonoran and Chihuahuan Deserts. This location has produced diverse natural resources within the memorial. The Huachuca Mountains originate near the memorial and extend north for about 25 miles. To the east and west lies a vast expanse of grasslands, the San Pedro River Valley, and the San Rafael Valley. There are no dams or known hazardous materials in the memorial.

SKY ISLANDS ECOSYSTEM

The “Sky Islands” of Arizona and New Mexico and northern Sonora form a unique complex of about 27 mountain ranges whose boundaries, at their lowest elevation, are desert scrub, grasslands, or oak woodlands. The Sky Islands and Sierra Madre region have been identified as a center of diversity for several groups of species. The great diversity of the Mogollon Highlands–Sky Islands–Northern Sierra Madre Occidental network stems from its location, elevation, and history. Trending north and south between the Rocky Mountains and the Sierra Madre Occidental Mountains of Mexico, the Sky Islands are at the meeting point of temperate North American species and warm subtropical species. They straddle two floristic provinces — the Neotropic and Holarctic — and two faunal realms — the Neotropic and Nearctic. They also are at the point of convergence of three climatic zones: tropical, subtropical, and temperate. (Sky Islands Alliance, from Internet).

In southeastern Arizona, the Huachuca, Pinaleno, Chiricahua, and Santa Rita Mountains, which have elevations up to 10,000 feet, provide a variety of habitats, from deserts and grasslands through oak woodlands and pine forests.

PHYSIOGRAPHY

Vegetation in the memorial is typical of the Upper Sonoran Zone and the mountains of southeastern Arizona. It includes desert grasses and shrubs at lower elevations. At higher elevations, forests primarily are made up of oak, Mexican piñon pine, and alligator juniper. The scientific names for all the plants and animals mentioned in this document are listed in appendix E.

The Huachuca Mountains, which are partly within the national memorial boundary, consist of a primary northwest-southeast trending central ridge about 25 miles long and 4 miles wide. The central ridge is secondarily faulted and dissected by numerous canyons that drain to the east and west. Miller Peak, 2 miles north of the memorial, reaches an elevation of 9,445 feet (Wallmo 1955; Toolin 1980; Ruffner and Johnson 1991).

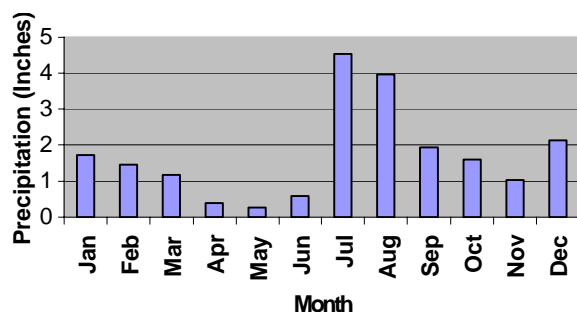
Elevations in the memorial range from 4,750 feet in the southeastern corner to 7,825 feet along the northwest boundary. Steep terrain predominates in the northern and western parts of the memorial, particularly in Montezuma Canyon, although the eastern scarp rises most steeply at higher elevations. The southeastern quarter of the memorial is a broad grassland plain dissected by numerous drainages. The eastern and southern parts of the Huachuca Mountains, including Montezuma Canyon, drain into the San Pedro River.

CLIMATE

The average yearly precipitation at the national memorial ranges from 10 to 33 inches, with an average of 21 inches. About 40% of the precipitation in this area falls as afternoon thundershowers in July and August, and about 25% falls as rain and snow in December through February. Normal summer temperatures range from 50°F to 90°F; winter,

from 30°F to 60°F. Figure 1 displays a 40-year average (1961–2000) of precipitation data collected at the memorial.

FIGURE 1: PRECIPITATION DATA, 1961–2000, CORONADO NATIONAL MEMORIAL



CAVE RESOURCES AND ABANDONED MINES

Mines

Caves and abandoned mines in the memorial are important, because of the fauna that use them, as well as because of their historic use by humans. A number of abandoned mines in the memorial are remnants of previous copper mining. The National Park Service installed bat-friendly gates at the entrances of two mines to protect human health and safety, as well as protecting the fauna that inhabit the mines. These gates are effective in restricting visitors from entering the mines while still allowing bats and other wildlife species to enter them. Some mines are described under “Cultural Resources” (see p. 102) because they have historic qualities. The mines themselves would not be affected by activities associated with any alternative. The effects on wildlife that each alternative would cause are described in the sections headed “Threatened, Endangered, or Sensitive Species” and “Wildlife” in the “Environmental Consequences” chapter.

Coronado Cave

Several caves in the memorial have geological value, the most prominent being Coronado

Cave, which is 0.75 mile from the visitor center, up a steep trail. Before hiking to the cave, visitors must obtain a free permit. Coronado Cave is about 600 feet long, 20 feet high, and 70 feet wide. There are several crawlways and passages, but they are not extensive. Fewer than 5,000 people visit Coronado Cave each year, which is about 5% to 6% of the total yearly visitors.

The limestone in which Coronado Cave formed is 250–300 million years old. Water has seeped through cracks in the limestone, slowly dissolving the rock. In the cave can be seen tilted bedding planes of limestone, which illustrate the region’s geologic history (NPS 2000a). The cave contains a beautiful range of formations: stalactites (hanging from the ceiling), stalagmites (rising from the ground), flowstone (calcite that appears to be smooth and flowing) and helictes (tiny crystalline shrubs). These formations are still growing.

Coronado Cave is home to a diverse community of insects: beetles, millipedes, spiders, and crickets. Some insect species are adapted to the darkness and low-energy environment of the inner cave. Mammals that use the cave include coatimundis, ringtails and bats. These animals usually do not venture far into the cave but stay near the entrance where there is adequate light. Several bat species have been observed in the cave. Bats depend on the dark, quiet cave environment for sleeping and hibernation (NPS 2000a).

AIR QUALITY

Coronado National Memorial is a class II airshed. Under the Environmental Protection Agency (EPA) class II designation, there is no monitoring for visibility, and some degradation in air quality is allowed. The nearest air quality monitoring station is in the town of Douglas, also in Cochise County. This station monitors ambient air for carbon monoxide (CO), ozone (O₃), lead (Pb), and two sizes of particulate matter, 2.5 microns (PM_{2.5}) and 10 microns (PM₁₀). There have been no

reports that any measured parameters have exceeded air quality standards at the monitoring station (AZ Dept. of Env. Qual. 2000a).

Coronado National Memorial is in a rural area; so it is not affected by emission from urban traffic or industry. Occasional haze and decreased visibility in the memorial are largely due to dust and dirt from local sources (agricultural fields, dirt roads, or construction sites) being picked up by the prevailing winds. Tucson, about 75 miles to the northwest, is a nonattainment area for air quality, and pollution generated there is carried to the skies above the memorial.

Although the National Park Service has little direct control over air quality in the region, the memorial cooperate with the Arizona Department of Environmental Quality and the Environmental Protection Agency to monitor air quality and protect it from degradation. In addition, the National Park Service will take the following actions to meet legal and policy requirements related to air quality:

- participate in regional air pollution control plans and review permit applications for major new air pollution sources
- conduct memorial operations in compliance with federal, state, and local air quality regulations

Effects on air quality can be short- term or long- term. Short- term impacts usually are associated with vehicle traffic or construction activities and often consist of fumes and fugitive dust generated by construction equipment. Long- term emissions are those caused by stationary, consistent polluters such as power plants and industry.

SOILS

Soils in Coronado National Memorial are variable, with soil depths ranging from less than 20 inches on the steeper slopes to more than 60 inches on the lower slopes. They

typically are high in rock fragments. Sandy loams and gravelly sandy loams are the most frequently encountered surface and subsurface textures. Other textures present include coarse sandy loam, clay loam, and gravelly clay.

Table 10 lists the soils in the memorial and contains a description of the associated slope, elevation, and ecological site. Only soil types with potential to be affected by alternative actions are included. The table also indicates the soils present on each grazing allotment. The list is based on a survey of the area conducted in 1996 (NRCS, USDA 2000).

The erosion potential associated with each soil complex is shown in table 10. The erosion factor (K) indicates the susceptibility of a soil to sheet and rill erosion by water. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by rain. Wind erodibility indicates the susceptibility of soil to wind erosion. The classification of erodibility groups in the memorial ranges from 2 (highly erodible) to 8 (less subject to wind erosion). Erosion potentials for many soils in the memorial fall in the high range and should be of concern with regard to grazing. High erosion potential is compounded by soils that have rapid runoff potentials and low water- holding capacity. Figure 2 depicts the distribution of memorial soils. More detailed descriptions of soils are available in USDA 1979 and NRCS, USDA 2000.

VEGETATION AND RANGE CONDITION

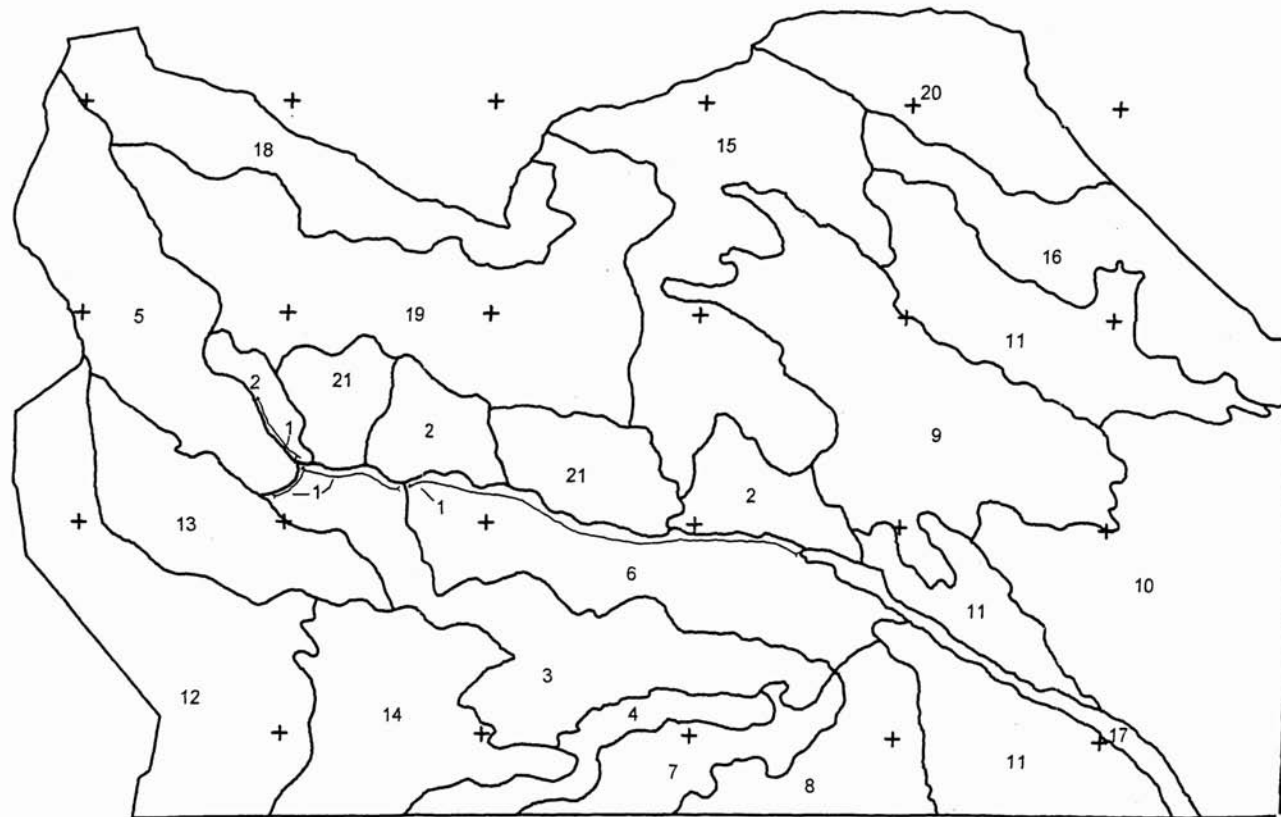
The vegetation in Coronado National Memorial was surveyed and mapped in 1991. It was classified into biotic communities, and a determination of acreage was made for each biotic community (Ruffner and Johnson 1991). In addition, Parfitt and Christy (1992) provided a detailed listing of more than 580 plant species collected at the memorial and housed at Arizona State University.

TABLE 10: SOILS CHARACTERISTICS, CORONADO NATIONAL MEMORIAL, COCHISE COUNTY, ARIZONA

Map Unit	Soils	Slope Range (%)	Ecological Site/Precipitation Zone	Elevation (feet)	Presence on Grazing Allotment	Erosion Factor K	Wind Erodibility Group
1	Aridic Ustifluvents- Riverwash complex	4-7	Sandy Bottom (QUHY, QUAR)/ 20-23 inches	5,200-5,800		0.02-0.05	2-6
2	Budlamp- Kinockity- Rock outcrop complex	8-20	Shallow Hills/ 16-20 inches	5,100-6,000	MZ ^{a/}	0.02-0.05	8
3	Canquya- Rock outcrop complex	50-75	Shallow Hills (QUEM, QUAR, JUDE)/ 20-23 inches	5,600-6,600	JS, MZ	0.05-0.49	6-8
4	Canquya- Rock outcrop complex, warm	50-75	Shallow Hills (QUEM, QUAR, JUDE)/ 20-23 inches	5,600-6,600	JS	0.05-0.49	6-8
5	Canquya- Tomarizo- Yarbam complex	35-65	Shallow Hills (QUEM, QUAR, JUDE)/ 20-23 inches; Limestone Hills/ 16-20 inches	5,600-6,800		0.05-0.10	5-6
6	Canquya- Zaleska- Morimount complex	25-50	Shallow Hills (QUEM, QUAR, JUDE)/ 20-23 inches	5,200-5,900	MZ	0.02-0.17	6
7	Coppercan- Canquya complex	30-60	Shallow Hills 16-20 inches	5,200-6,000	MZ	0.05-0.49	6
8	Coppercan- Yarbam- Rock outcrop complex	6-20	Shallow Upland/ 16-20 inches/ Limy Upland/ 16-20 inches Sandyloam Upland (QUAR, QUEM, QUOB)/ 16-20 inches	4,950-5,400	MZ	0.05-0.15	6-8
9	Gardencan complex	6-10	inches	5,100-5,600	JS, MZ	0.05-0.32	3-5
10	Gardencan- Larque complex	0-5	Shallow Hills/ 16-20 inches Sandyloam Upland/ 16-20 inches/	4,825-5,100	JS, MZ	0.05-0.28	3
11	Gardencan- Terrarossa complex	2-18	Loamy Upland/ 16-20 inches	4,800-5,400	JS, MZ	0.05-0.32	5-6
12	Guaynaka- Costavar- Rock outcrop complex	30-60	Shallow Hills/ 16-20 inches	5,500-5,864		0.05	6-7
13	Guaynaka- Costavar- Rock outcrop complex	65-75	Shallow Hills (QUEM, QUAR, JUDE)/ 20-23 inches	5,800-6,864		0.05	6-7
14	Guaynaka- Rock outcrop complex	45-60	Shallow Hills/ 16-20 inches	5,350-6,500		0.05	6-8
15	Kinockity- Budlamp- Rock outcrop complex	45-75	Shallow Hills/ 16-20 inches Shallow Hills/ 16-20 inches/	5,300-6,900	JS	0.02-0.05	8
16	Lutzcan- Yarbam complex	25-50	Limestone Hills/ 16-20 inches	5,000-6,000	JS	0.05-0.10	6
17	Montcan- Amuzet- Riverwash complex	3-5	Sandy Bottom/ 16-20 inches	4,850-5,200	JS, MZ	0.02-0.15	2-5
18	Morgamine- Yaquican complex	3-5				0.02-0.10	6
19	Rock outcrop- Kinockity complex	50-75	Shallow Hills/ 16-20 inches	5,800-7,000	JS	0.02-0.05	8
20	Yabamar- Bothompeek- Rock outcrop complex	60-80	Shallow Hills/ 16-20 inches	5,600-7,300	JS	0.02-0.1	8
21	Yarbam- Rock outcrop- Morimount complex	30-60	Limestone Hills/ 16-20 inches	5,300-6,000		0.02-0.10	6-8

a/ JS = Joe's Spring allotment. MZ = Montezuma allotment.

FIGURE 2: CORONADO NATIONAL MEMORIAL SOIL MAP
(DATA FROM NATURAL RESOURCES CONSERVATION SERVICE, USDA, BY DENNY AND PEACOCK 2000,)

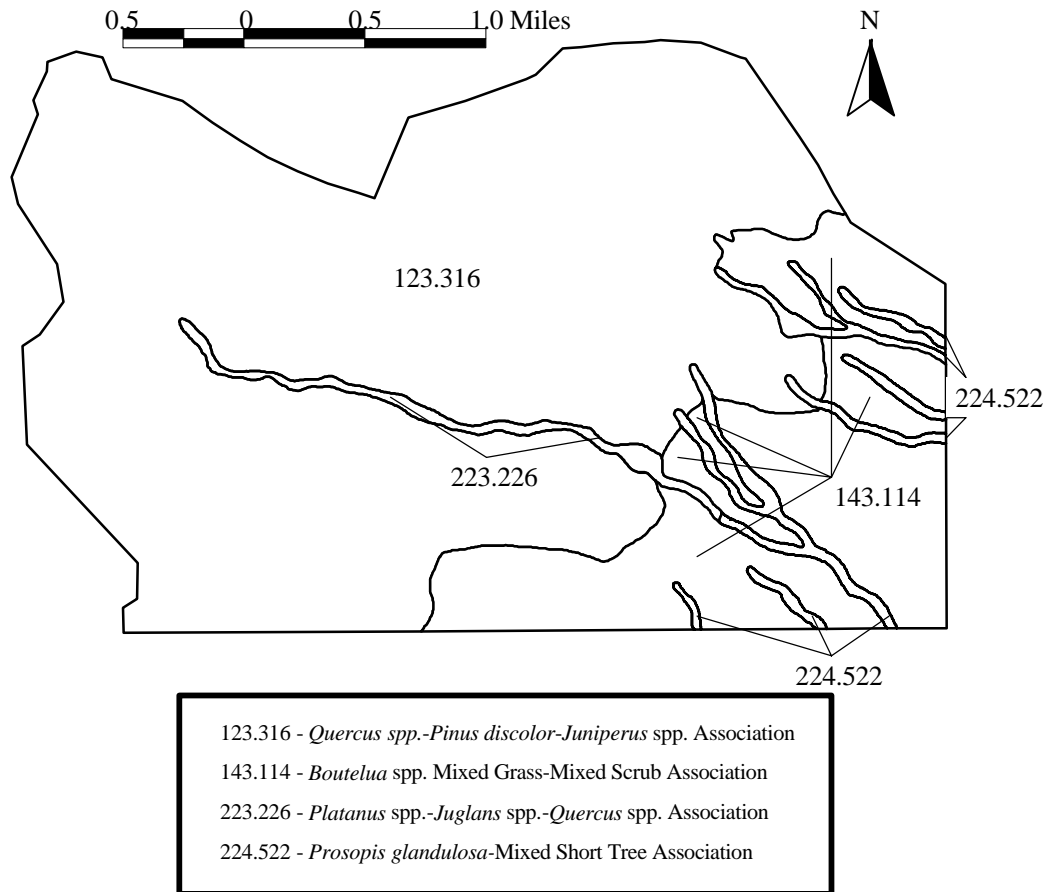


(See next page for legend.)

Legend for Figure 2.**Soil Characteristics**

- 1 Aridic Ustifluvents- Riverwash complex, 4 to 7 percent slopes
- 2 Budlamp- Kinockity- Rock Outcrop complex, 8 to 20 percent slopes
- 3 Canquya- Rock outcrop complex, 50 to 75 percent slopes
- 4 Canquya- Rock outcrop complex, warm, 50 to 75 percent slopes
- 5 Canquya- Tomarizo- Yarbam complex, 35 to 65 percent slopes
- 6 Canquya- Zaleska- Morimount complex, 25 to 50 percent slopes
- 7 Coppercan- Canquya complex, 30 to 60 percent slopes
- 8 Coppercan- Yarbam- Rock outcrop complex, 6 to 20 percent slopes
- 9 Gardencan complex, 6 to 10 percent slopes
- 10 Gardencan- Larque complex, 0 to 5 percent slopes
- 11 Gardencan- Terrarossa complex, 2 to 18 percent slopes
- 12 Guaynaka- Costavar- Rock outcrop complex, 30 to 60 percent slopes
- 13 Guaynaka- Costavar- Rock outcrop complex, 65 to 75 percent slopes
- 14 Guaynaka- Rock outcrop complex, 45 to 60 percent slopes
- 15 Kinockity- Budlamp- Rock outcrop complex, 40 to 75 percent slopes
- 16 Lutzcan- Yarbam complex, 25 to 50 percent slopes
- 17 Montcan- Amuzet- Riverwash complex, 3 to 5 percent slopes
- 18 Morgamine- Yaquican complex, 55 to 70 percent slopes
- 19 Rock outcrop- Kinockity complex, 55 to 70 percent slopes
- 20 Yabamar- Bothompeek- Rock outcrop complex, 60 to 80 percent slopes
- 21 Yarbam- Rock outcrop- Morimount complex, 30 to 60 percent slopes

**FIGURE 3: VEGETATION ASSOCIATIONS AT CORONADO NATIONAL MEMORIAL
AS MAPPED BY RUFFNER AND JOHNSON 1991)**



Four plant associations have been identified in the area: oak- Mexican piñon- juniper association (QPJ), grama species mixed grass- mixed scrub association (BMM), sycamore- walnut- oak association (PJQ), and honey mesquite- mixed short tree association (PMT). QPJ is the most common plant association in the memorial, covering 3,400 of 4,750 acres. Next most common, but far less prevalent is BMM, which covers 1,063 acres. See figure 3, from Ruffner and Johnson 1991).

The QPJ association is an open, evergreen woodland community. Grasses typically comprise most of the understory. In the memorial, this association occurs mostly on north- and south- facing slopes of the Huachuca Mountains. Dominant species vary with site, slope, and exposure.

Typical plant species are alligator juniper, Arizona white oak, Emory oak, manzanita, Mexican blue oak, mountain mahogany, beargrass, desert spoon, and side oats grama. Appendix E contains a list of the scientific names for these and the other plant species.

The BMM association is largely a Chihuahuan semidesert grassland community dominated by perennial grasses and shrubs. Characteristic plant species are fairy duster, rabbit brush, hedgehog cactus, Palmer agave, Lehmann lovegrass, and blue grama. Lehmann lovegrass, a species introduced from South Africa, appears to be spreading throughout much of southern Arizona to the detriment of native grasses that are more palatable to grazing animals (Brown 1982).

The PJQ association is a mixed- broadleaf forest community that often forms a well-developed gallery but has sparse understory flora. This association occurs along major and secondary drainages where water is perennial or seasonally intermittent, such as in middle and upper Montezuma Canyon. Consequently, this association comprises only about 100 acres in the memorial. Plant species typical of this association are Arizona white oak, Arizona rosewood, Arizona sycamore, catclaw acacia, manzanita, brickellia, wild grape, and needle grass.

The PMT association is a type of Sonoran Desert riparian forest that typically occurs below 3,900 feet and is restricted to areas around streams, springs, ephemeral drainages, and areas that have a shallow water table. Trees usually do not form a closed canopy in this association. The association, which is a minor biotic community in the memorial (covering about 224 acres) is found in the eastern third of the memorial along drainages of lower Montezuma Canyon. Typical species in this association are Arizona white oak, desert willow, Emory oak, honey mesquite, poison ivy, rabbit brush, sumac, cane cholla, Lehmann lovegrass, and side oats grama.

The Joe's Spring and Montezuma grazing allotments cover 39% of Coronado National Memorial. The current range condition in the grazing allotments varies between and within allotments. The Joe's Spring allotment generally has more mature series than the Montezuma allotment, probably because the steep slopes in the Joe's Spring allotment limit livestock grazing in many areas.

The most common vegetation associations in the grazing allotments are the oak- Mexican piñon- juniper and grama species mixed grass- mixed shrub associations, which constitute 93 percent of the memorial's total vegetation (NPS 2000b). Brady et al. (1989) have documented significantly greater native plant species richness in ungrazed areas compared to those that are grazed.

The potential natural community is the biotic community that would become established if all successional sequences were completed without interference by humans under the present environmental conditions (Soc. for Range Mgmt. 1989). In addition to potential natural community, standard condition classes are early, mid, and late seral. Range condition is computed as a number between 0 and 100, representing the percentage of potential vegetation. Ratings of 0 to 25 are considered early seral, 26 to 50 are mid seral, and 51 to 75 are late seral. Scores above 75 are classified as potential natural community. Utilization is defined by the Society for Range Management (1989) as the "proportion of current year's forage production that is consumed or destroyed by grazing animals."

Livestock seeking water, succulent forage, and shade can spend a disproportionate amount of time in riparian communities. Data collected in the Joe's Spring allotment in 1989 indicated that the southern part of the allotment had utilization levels of more than 30%, with a more than 45% use of an area near water. Cattle congregating to graze and water at ephemeral streambeds trample vegetation and compact soils, leading to streambank sloughing, soil erosion, and poorer water quality (Armour, Duff, and Elmore 1991). The presence of cattle in riparian areas leads to trampling and overgrazing of streambanks, soil erosion, loss of streambank stability, declining water quality, and drier conditions. Unstable streambanks lead to increased sediment load in the water and inferior water quality during periods of runoff. These changes can lead to reduced habitat for riparian plant species and wildlife, thereby causing many native species to decline in number and density (Belsky, Matzke, and Uselman 1999).

In the most recent inventory (Ogden 1995), about 54% of the Joe's Spring allotment was rated as potential natural community. About 34% was rated as mid seral, and 12% was not rated. However, because the range inventory did not consider all factors of range health, the

condition may have been overestimated. For example, neither erosion nor the age distribution of plants was considered.

A positive correlation between slope and range condition was noted in the Joe's Spring allotment, indicating that areas on lower slopes are more heavily grazed than steeper areas. This matched observations that livestock use is concentrated on the lower slopes in the southern third of the allotment. In 1995 and 1996, inspection of the allotment showed utilization to be in excess of 50% throughout much of the lower portion of the pasture (L. Benson, personal observation).

U.S. Forest Service monitoring data from the Montezuma allotment in 1985 showed that a third of the allotment had a utilization rate greater than 45%. Another third was between 25% and 45% utilization, and the remainder had a utilization rate under 25%.

There have been no livestock in the Montezuma allotment since 1990. In the most recent inventory of that allotment (Ogden 1995), 23% of the area was early seral, 17% was mid seral, 43% was late seral, and 16% was potential natural community. Much of the eastern part of the allotment is dominated by Lehmann lovegrass, a nonnative introduced grass primarily rated as early seral. Areas with limited access because of slope had more mature series than did grazed areas. The presence of mid to late seral stages in 60% of the area indicated that plant recovery was in progress several years after livestock removal.

Under the *Livestock Management Plan* (NPS 2000b), grazing management has intensified. The goal is to improve the condition of the range in the future. Implementation of the plan has involved the following:

- Reducing the animal unit months to reduce the effect of grazing on native vegetation.
- Adjusting the season of use to avoid grazing during vegetative growing seasons.

- Implementing a comprehensive vegetation monitoring plan.
- Providing flexibility of use in both number of animal unit months and season of use, based on environmental indicators.

An important plant species in Coronado National Memorial is the Palmer's agave (*Agave palmeri*). It is the only agave in the national memorial that occurs in sufficient numbers to study. All of the information presented here is from *The Status of Palmer's Agave at Coronado National Memorial* (Hawks 1997). The nectar of flowering Palmer's agave is an important food source for the lesser long-nosed bat and the Mexican long-tongued bat, both of which are discussed in the next section entitled "Threatened, Endangered, or Sensitive Species." Hummingbirds also drink the nectar produced by the flowers.

Herbivores such as cattle, white-tailed deer, and small rodents eat the newly emerged flowering stalks of the plant. Hawks (1997) postulates that deer and other wildlife may depend on the water and energy obtained by eating the flowering stalks, and that the energy in the flowering stalks may be especially important for pregnant deer.

Hawks (1997) cites studies by Martinez-Morales and Meyer (1985) and by Hodgson and DeLamater (1988) that found grazing was detrimental to other species of agave, including Arizona agave (*Agave arizonica*) and margay verde (*Agave salmiana* spp. *crassispina*). She reports that these studies attributed adverse effects to the grazing of flowering stalks, trampling of young individual plants, and soil compaction.

To determine the effects of cattle grazing on Palmer's agave in Coronado National Memorial, Hawks (1997) established four test plots in areas that currently are grazed, and five test plots in areas in the park that had not been grazed for at least seven years. She also established two test plots in similar settings at

nearby Fort Huachuca that had not been grazed for more than 45 years. In presenting her conclusions, Hawks cautioned that only two years of data were available and that additional study should be conducted. She then stated: Another objective of this study was to determine the extent of herbivore predation in Palmer's agave. Palmer's agave flowering stalks proved to be fairly important to the herbivores present in the plant's range. High predation occurred in all the plots, grazed and nongrazed. The final objective was to determine if grazing was negatively affecting Palmer's agave. There is no evidence that grazing is impacting the population, and no significance between recruitment in the two treatments was found. It was also determined that other herbivores, such as deer, can cause as much stalk predation as cattle.

THREATENED, ENDANGERED, OR SENSITIVE SPECIES

Several species identified as sensitive at the federal or state level are known to exist in Coronado National Memorial or may exist in the memorial. The large number of sensitive species in the region is attributable to the diversity of habitats present.

The U.S. Fish and Wildlife Service provided a list of threatened, endangered, proposed, and candidate species for Cochise County in March 2000 (see appendix F). As is discussed

below, many of these species do not inhabit the memorial because it does not provide suitable habitat. Other species historically have been observed in the memorial but have been extirpated or have not been recorded in the area for many years. Table 11 lists the four species on the USFWS list that probably exist in the memorial (and potentially could be affected by the alternative actions).

Arizona lists two species as species of concern that are known to exist in the memorial — the barking frog and the elegant trogon. These species were not included in this evaluation because none of the action alternatives would affect them or their habitats.

Threatened, endangered, proposed, or candidate fauna known to have existed historically in Coronado National Memorial are Mexican wolf, ocelot, bald eagle, Sonora Tiger salamander, Arizona shrew, black-tailed prairie dog, and jaguar. Although Coronado National Memorial has potential habitat for these species, they are not known to exist in the memorial at this time.

Jaguarundi have been reported in or near the Huachuca Mountains but never have been confirmed in Arizona. Potential habitat may exist in the memorial, but this area may be outside the range of the species. The Yaqui

TABLE 11: SPECIAL STATUS SPECIES THAT MAY EXIST IN CORONADO NATIONAL MEMORIAL

Federal Status: Endangered = species in imminent jeopardy of extinction; Threatened = species in imminent jeopardy of becoming endangered; Species of Concern = a species that may or may not be listed in the future. State Status: WC = Wildlife species of concern in Arizona: species whose occurrence in Arizona is or may be in jeopardy, or with known or perceived threats or population declines.			
Common Name	Scientific Name	Federal Status	State Status
Lesser long-nosed bat	<i>Leptonycteris curasoae</i>	Endangered	WC
Mexican long-tongued bat	<i>Choeronycteris mexicana</i>	Species of concern	WC
Loggerhead shrike	<i>Lanius ludovicianus</i>	Species of concern	No status
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened	WC

topminnow, cactus ferruginous pygmy- owl, and whooping crane are known to exist or have existed in Cochise County. However, the memorial has little or no potential habitat for these species, and they are not known to inhabit the memorial.

The U.S. Fish and Wildlife Service lists three plant species as existing in Cochise County: Canelo Hills ladies' tresses (endangered), Cochise pincushion cactus (threatened), and Huachuca water umbrel (endangered). None of these is known to be in the memorial; therefore, they were dismissed from further consideration.

Lesser Long- Nosed Bat

The lesser long- nosed bat was on the federal list as endangered on September 22, 1988. It also is classified as a state wildlife species of special concern. The bat was in jeopardy because of disturbance to roost sites and direct killing by humans. In addition, the bats are threatened by a loss of food sources (paniculate agave) because of activities such as agave harvesting by the liquor industry in Mexico. Studies on the lesser long- nosed bat have been conducted by Cockrum and Hayward (1962), Howell (1974, 1976, 1980), Howell and Roth (1981), and Fleming, Nunez, and Sternberg (1993).

This bat's size is medium to large, and it has an elongated muzzle, a small leaf shaped nose, and a long tongue. It is yellowish brown or gray above and cinnamon brown below. Its tail is minute and appears to be lacking. This species usually can be found in Arizona from April to September and in Mexico the rest of the year.

The lesser long- nosed bat feeds on agave and columnar cacti. In the daytime it roosts in caves and abandoned tunnels, where it is easily disturbed. By night it forages on nectar and pollen from saguaros, organ pipe cactus, and agaves. Lesser long- nosed bat roosts have been found in southern Arizona, southwest New Mexico and throughout Mexico. Surveys

conducted between 1992 and 1993 indicate that the greatest densities of lesser long- nosed bats, based on the sizes of roosts, were found in northern Mexico and southern Arizona. The estimated sizes of roosts in Arizona and Mexico during this period ranged from 20 to 150,000 bats (USFWS 1995c).

During the reproductive season of April through June, lesser long- nosed bats are found at lower elevations in southwestern Arizona, where they establish maternity roosts. At higher elevation sites such as Coronado National Memorial, there are no sizable aggregations of lesser long- nosed bats until the latter part of July. The number of bats peaks in mid to late August, and most are gone by mid- September. This residency period of 6 and 8 weeks corresponds well with the blooming of Palmer's agave, which the bats use for food (Petryszyn and Alberti n.d.).

Before it was designated a national memorial, the Coronado area was extensively mined. This activity produced numerous adits, shafts, and prospects. Most of these are potential roost sites for bats, as are caves. In 1993 a major roost with more than 18,000 bats was discovered in the memorial. The bats occupy the site from the latter part of July to September or October (Petryszyn and Alberti n.d.). The population has averaged about 16,000 bats, fluctuating from a high of 31,000 in 1999 to a low of 9,000 in 1995.

Bat management in the memorial includes the placement of bat- friendly gates over the mouths of abandoned mine tunnels that are used as bat roosts. The gates prevent visitors from entering the tunnels while providing access for the bats.

Agave stalks are rich in carbohydrates, and as they begin to bolt, they are particularly palatable to domestic livestock and wild herbivores, including deer, javelina, rodents, and rabbits (Howell 1996).

Concern has been expressed about the impacts of grazing on agaves, the bats' primary

food source. Some studies found grazing to be detrimental to populations of agaves such as marguay verde because cattle consume the agaves' flowering stalks and trample young plants (Martinez- Morales and Meyer 1985). However, Hawkes (1997) found in Coronado National Memorial that other herbivores, such as deer, can cause as much stalk predation as cattle, and that there was no evidence that grazing is impacting the agave population. The U.S. Fish and Wildlife Service concurred that the new allotment management plans for Joe's Spring and Montezuma allotments would not be likely to adversely affect the lesser long- nosed bat. Both allotment management plans include an agave monitoring program to ensure that grazing does not reduce the agave population.

Mexican Long- Tongued Bat

The U.S. Fish and Wildlife Service lists the Mexican long- tongued bat as a species of concern, and the state of Arizona lists it as threatened (from the Internet at < www.mesc.nbs.gov/research/5003230.asp>). It appears to be threatened by the loss of food supplies and killing by humans.

The Mexican long- tongued bat is found from Central America to the southwestern United States, typically living in deep mountain canyons with dense riparian vegetation. In Arizona it is found from the lower edge of the oak zone to the fir belt. During the day, this species roosts in caves, rock fissures, old mines, and occasionally in buildings, usually in groups of fewer than 12 individuals. In Coronado National Memorial, this species has been captured in nets at water tanks. It also has been observed at several mine adits in the area and at hummingbird feeders. Mexican long- tongued bats are never found in great number, and they may move around from roost to roost on a nightly or weekly basis. They typically arrive in late spring and remain into autumn (Petryszyn and Alberti n.d.).

Mexican Spotted Owl

All of Coronado National Memorial is within the critical habitat for the Mexican spotted owl. A pair of these owls was first found in the memorial in 1997, and there were numerous sightings in 1998 in a small canyon west of the nest site. The pair bred and successfully fledged young in 1997 and 1999, using the same nest site both times. The memorial is in the process of establishing a protected activity center for this pair that will be based on topography and vegetation in the area surrounding the nest site.

The Mexican spotted owl is on the federal list of threatened species. It also is a species of special concern in Arizona. This species is threatened by habitat loss caused by logging and fires, increased predation associated with habitat fragmentation, and a lack of adequate protective regulations.

The Mexican spotted owl closely resembles the larger barred owl, but the plumage is more brown, with numerous white spots above and below. The posterior underparts have short, horizontal bars or spots rather than long, vertical streaks. These are the largest brown-eyed, tuftless- eared owls in their range. Their length usually is about 17.5 inches, and their wingspan is about 3.5 feet.

Mexican spotted owl nesting and roosting sites generally consist of multilayered, uneven- aged forests with high canopy closure or rocky shaded canyons (USFWS 1995b). Information is limited on the habitat use by foraging owls in southeastern Arizona. However, in northern Arizona, Mexican spotted owls forage primarily in mixed conifer forest on rocky slopes and pine- oak- juniper forests (Ganey and Balda 1994).

The Mexican spotted owl's geographic range covers portions of southwestern United States and extends into Mexico. Within this area, the Mexican spotted owl recovery team delineated six recovery units in the United States and five in Mexico. The Huachuca

Mountains are included in the Basin and Range–West Recovery Unit, which is characterized by mountain ranges isolated by desert basins. This recovery unit is believed to be important habitat because of the high number of spotted owls relative to other recovery units (USFWS 1995b).

A survey of mammals in the memorial conducted in 1996–1997 (Swann et al. 2000) mapped the presence of nocturnal rodents, including wood rats (*N. albigula*) and peromyscid mice, the Mexican spotted owls' most likely prey base in this area. Prey species of the Mexican spotted owl do not inhabit the grasslands of the Montezuma allotment, (about 93% of the allotment's vegetation). Prey species are common in the grasslands of the Joe's Spring allotment (68% of the allotment's vegetation) but uncommon in the oak woodlands (29%). They are extremely common in the riparian areas of both allotments (7% of Montezuma allotment vegetation; 3% of Joe's Spring allotment vegetation).

Within 0.5 mile of the protected activity center, prey species are extremely common in the mosaic of oak woodlands, oak savannas with abundant grasses, and oak riparian communities in the drainages. Specifically, prey species are 4–20 times more common there than they are in the grasslands and woodlands (which make up 95% of the combined allotment vegetated area). Prey biomass is also higher near the protected activity center because wood rats are more abundant in the upper- elevation oak savannas.

Loggerhead Shrike

Loggerhead shrikes, commonly known as butcher birds for their habit of impaling their prey on thorns, are a federally listed species of concern that has been sighted in the memorial. Shrikes are songbirds with hawk-like behavior and hook- tipped bills. They

feed on insects, lizards, mice, or small birds (Peterson 1961).

Loggerhead shrikes are found from southern Canada to southern Mexico in open country. Common habitat features include lookout posts, wires, scattered trees, low scrub, or deserts. The shrikes nest in bushes or trees and breed from southern British Columbia south through the western United States. They winter mainly in the southwestern states. Loggerhead shrikes are rare in Coronado National Memorial, with sightings occurring in spring, summer and winter (SW Parks and Monuments Assn. 1993).

The populations of loggerhead shrikes have declined drastically. The population decline is thought to be due to the following causes:

- The use of pesticides, which has reduced the supply of insects, the shrikes' main food. Pesticides also may have adversely affected the birds' reproductive physiology (from the Internet: www.dnr.state.wi.us/org/land/er/factsheets/birds/shrike.htm).
- The loss of habitat, including wintering habitat, due to land development in coastal regions (from the Internet: www.wbu.com/chipperwoods/photos/logshrike.htm).

WATER RESOURCES AND WATER QUALITY

Coronado National Memorial is in the Sierra Vista subwatershed of the Upper San Pedro Basin in southeastern Arizona. The watershed encompasses about 950 square miles, extending from the international boundary with Mexico to about 27 miles north of Fairbank, Arizona (USGS 1999). The subwatershed is drained by the San Pedro River, which drains about 4,600 square miles. This river extends almost 200 miles from its headwaters in Sonora, Mexico, to its confluence with the Gila River near Winkleman, Arizona.

Historically, the water quality in the Upper San Pedro River basin has been compromised when storms have released pollutants from tailings or holding ponds and when sewage or mining wastes have been released. These have severely impacted surface waters in the San Pedro River. Regional surface water issues involve water quality in the San Pedro River and its tributaries.

Most surface waters in the memorial are ephemeral streams, consisting of dry washes, arroyos, or continuous and discontinuous gullies. Most of these surface water features drain toward the southeast. Ephemeral streams are dry most of the time, with flow generally occurring only for a short time after extreme storms. Some streams in the area probably were perennial before Tombstone (northeast of the memorial) began to divert streamflow for municipal use (AZ G&F Dept. 1954, cited in Ruffner and Johnson 1991).

Montezuma Canyon is the major drainage in the memorial. It receives flow from several ephemeral streams before its confluence with the San Pedro River. Evidence of streambank erosion and downcutting in Montezuma Canyon can be seen in areas where development and grazing have occurred. In addition, large amounts of eroded soils that have been transported downstream can be seen along drainageways.

There are at least 21 wells in the memorial. The well that provides water for NPS staff and visitors appears to have no additional capacity. If visitation or NPS staff increased, a study might be necessary to determine how to get more water or conserve enough to meet additional needs. The following other water resources are in the national memorial:

- a few seeps and springs — during wet years, Yaqui Springs and other springs will trickle much of the year.
- three stock tanks that have been developed for livestock use

- a water storage tank just north of the visitor center and employee residences

WILDLIFE

Coronado National Memorial has a great diversity of wildlife species for its size — mammals, reptiles, birds, and amphibians. This probably is due to a number of factors, including the presence of thick grassland vegetation; the memorial's location in the Sky Island ecosystem; and its connection to other natural areas nearby, including Coronado National Forest, the San Pedro River, and undeveloped areas in Mexico (Swann et al. 2000).

Recent inventories of the vertebrate fauna have identified 33 reptile and 5 amphibian species, 11 bat and 43 terrestrial mammal species, and 190 species of birds in memorial (Cockrum et al. 1979; Swann et al. 2000; (Petryszyn and Alberti n.d.); Swann, Alberti, and Schwalbe 2001; plus unpublished memorial observation data). Some reptiles in the vicinity of the visitor center may be night snake, common king snake, mountain patchnose snake, Chihuahuan blackhead snake, and lyre snake.

In addition to bats, the mammal species confirmed in the memorial are 1 marsupial, 1 insectivore, 2 rabbits and jackrabbits, 23 rodents, 13 carnivores, and 3 hoofed animals (Swann, Alberti, and Schwalbe 2001). Eighteen more mammal species may inhabit the memorial but were not confirmed during the study, or they were in the memorial in the past but probably are not there now.

Common bird species in the national memorial are hummingbirds, warblers, wrens, and sparrows. Raptors, including red-tailed hawk, Cooper's hawk, and American kestrel, are present but are observed less frequently.

CULTURAL RESOURCES

The following paragraphs contain an overview of the history of the region and the memorial, recent research, descriptions of the types of resources at the site, and inventories of specific extant resources.

THE EXPEDITION

Coronado National Memorial is the largest of 28 national memorials in the national park system. National memorials that commemorate people or events often have no tangible physical objects for visitors to relate to; therefore, interpretive materials are particularly important at a national memorial.

Early in the 16th century, Spain established a rich colonial empire in the Americas. From Mexico to Peru, gold poured into the Spain's treasury, and new lands were open for settlement. The frontier lay a few hundred miles north of Mexico City — beyond was unknown land. Antonio de Mendoza, viceroy of New Spain (Mexico), wanting to explore the land to the north of Mexico, selected Francisco Vázquez de Coronado. On January 6, 1540, Mendoza commissioned Coronado as expedition commander and captain-general of all lands he might discover and claim for king and country.

The expedition left Compostela on Mexico's west coast on February 23, 1540, with 336 Spanish soldiers, four priests, hundreds of Mexican-Indian allies, and 1,500 stock animals. Supplies were sent north by ship under Captain Hernando de Alarcón. After reaching Culiacán, Coronado and 100 soldiers marched ahead of the slower main army. It is most likely that the expedition traveled up the San Pedro River Valley, crossing into what became the United States just east of the present Coronado National Memorial.

They arrived on July 7, 1540, at Háwikuh, the first of the fabled Cities of Cibola. Instead of a

golden city, they found a rock-masonry pueblo crowded with American Indians. After unsuccessful negotiations, the Spanish attacked and forced the Indians to abandon their village. While at Háwikuh, Coronado sent his captains out to explore. Don Pedro de Tovar traveled to the Hopi Indian villages in northeastern Arizona, and García López de Cárdenas reached the Grand Canyon of the Colorado. Hernando de Alvarado and 20 men journeyed east past Acoma and Tiguex pueblos to Cicuye (Pecos) pueblo on the upper Pecos River. The army spent the winter of 1540–41 at Tiguex, where the Indians, at first friendly, grew hostile because of Spanish violations of hospitality and friendship. Battles followed, and the Spaniards killed the inhabitants of one pueblo and forced the Indians to abandon several others.

On April 23, 1541, the expedition set out for Quivira following an Indian guide. After 40 days, Coronado sent most of the men back to Tiguex and continued on with 30 others. At Quivira in central Kansas, they were again disillusioned — the houses in the villages were made of grass; there were no civilizations rich with gold and silver, as the guide had led them to believe. Coronado then had his Indian guide killed and led his men back to Mexico City in the spring of 1542. Although discredited, Coronado resumed his position as governor of New Galicia. He and his captains were called to account for their actions, and it was four years before he cleared his name.

Ten years after his return home, Coronado died in relative obscurity at 42. His actions had brought back knowledge of the northern land and its people. This opened a way for explorers and missionaries to colonize the Southwest and to help develop the distinctive culture we know today.

ARCHEOLOGICAL RESOURCES AND HISTORIC STRUCTURES

Aboriginal populations have been present in the area surrounding Coronado National Memorial for the past 10,000 years. Paleo-Indian activities took place in the San Pedro Valley near the memorial. The Cochise Culture (8500 B.C.–300 B.C.) originally was defined in the Sulphur Springs Valley to the east of the San Pedro. Cochise Culture has been divided into three stages: Sulphur Springs (7500 B.C.–3500 B.C.), Chiricahua (3500 B.C.–1500 B.C.) and San Pedro (1,500 B.C.–300 B.C.). The Paleo-Indian adaptations to the land represented a hunting-gathering lifeway. However, some evidence for sedentary farm and semipermanent pit house villages can be found toward the end of the San Pedro stage. Farming methods later expanded to include canal irrigation and permanent settlements, first in pit houses and later in aboveground pueblo form. The San Pedro Valley immediately east of the memorial displays this cultural history in its entirety: Paleo-Indian adaptations, Cochise culture, and later agricultural adaptations.

The Upper Piman and Sobaipuri Indians, who followed an agricultural lifestyle in proto-historical times, used the San Pedro and Santa Cruz Valleys. Coronado made contact with these groups, as did later Spanish explorers and missionaries. By A.D. 1500, the Hohokam culture was predominant and the Spanish settlement of the area began. In the late 18th century, the Spanish government gave land grants to settlers in the area. Following the War with Mexico, Mexican jurisdiction of the area ended with the Gadsden Purchase in 1854. The completion of the Southern Pacific Railroad in the 1860s allowed the expansion of cattle markets and increased the agricultural and mining possibilities. During the late 1800s, military posts were established. This resulted in extensive cattle ranching, farming, and mining by 1885.

The Huachuca Mountains attracted the attention of prospectors and miners. In the immediate vicinity of the memorial are several claims from this period. Mining in Montezuma Canyon began in the 1880s and continued sporadically over the years, but the only operation of any real duration was the State of Texas mine in Montezuma Canyon near the present northern boundary of the memorial. The mine, which produced commercial grade lead-zinc ore, was mined intermittently between 1902 and World War II.

Ranchers first arrived in the area in the late 1890s. At that time, water was one of the prime factors inviting settlement. Montezuma Creek was flowing, although it ceased to be a permanent stream shortly after the turn of the century. William Ratliff began ranching in the area of the memorial. After Ratliff's death in 1917, Joe Pyeatt, an heir, began ranching in the area at the site of the Montezuma Ranch. The ranch went through a series of owners.

Another activity common in Montezuma Canyon was the illegal production of liquor during the Prohibition era. The canyon's isolation made it an ideal place for the location and operation of stills. In addition, mescal was smuggled across the border for sale at Fort Huachuca during that period. A trail used by smugglers cuts through the eastern part of the memorial.

Coronado National Forest was established in the early 1900s. The Civilian Conservation Corps (CCC) in the 1930s constructed a road in the area of the memorial that went over Montezuma Pass. Coronado National Memorial was authorized in 1941 and established in 1952 by presidential proclamation. It was created from U.S. Forest Service lands.

Archeological surveys of slightly more than one-third of the memorial have been completed. Areas not surveyed are places where the terrain is too steep to conduct a survey. These surveys found both prehistoric and historic sites. The prehistoric sites were Cochise Culture hunting and gathering sites,

and the historic sites are related to mining and ranching activities. A total of 15 sites are listed on the NPS Archeological Management Information System.

Seven structures are listed on the list of classified structures for the memorial: International Boundary Monuments 100, 101, and 102; the ruins of the Doreador and Clark- Smith mining sites; graves associated with the former Ratliff Ranch; and a road constructed by the Civilian Conservation Corps. The resources determined eligible for nomination to the National Register of Historic Places were International Boundary Monuments 100, 101, and 102 and the Montezuma Pass Road.

The Ash Mountain and Sunnyside CCC camps were constructed near the Montezuma Pass Road between 1933 and 1935. This was a rural development project for the purpose of shortening distances between ranches from 103 to 11 miles. The last 2- mile stretch of the road in the memorial remains unpaved and contains 76 culverts with stone masonry headwalls and spillways. In 1998, many of the culverts, headwalls, and spillways received preservation treatment.

ETHNOGRAPHIC RESOURCES

Information about ethnographic resources in the national memorial is limited. On occasion,

members of the Apache tribe have gathered acorns on national memorial lands.

CULTURAL LANDSCAPES

Three Coronado National Memorial cultural landscapes are listed on the NPS cultural landscape inventory. A level II cultural landscape inventory will not be performed on any of these landscapes before 2002. A level I cultural landscape inventory has been completed for only one, Montezuma Ranch (in 1999). On the basis of that information, level II inventory is not planned for the ranch. The investigation concluded that ranch was of local significance, but there are severe integrity problems. The inventory concluded that the Montezuma Ranch is not eligible for listing on the National Register of Historic Places as a historic landscape. A level I cultural landscape inventory will be completed for abandoned mine sites (all sites would be considered one landscape) in 2002 if funding and staffing is available. The third landscape, the entire memorial viewshed, is scheduled for inventory after 2005. That inventory will look at previously unevaluated roads, trails, and structures to determine if any can be identified as being part of a cultural landscape.

VISITOR UNDERSTANDING AND RECREATIONAL RESOURCES

ACCESS AND VISITOR FACILITIES

No fee is required to enter Coronado National Memorial. Most visitors arrive by private vehicle through the east entrance from Arizona Highway 92. A small percentage of visitors, such as school groups or van tours, arrive by bus. Approximate driving times from nearby cities to the east entrance of the memorial are shown below.

Sierra Vista	0.50 hour
Bisbee	0.50 hour
Tucson	1.75 hours
Phoenix	3.75 hours

The nearest airport of any size is in Tucson, but flights are available to Sierra Vista. Travelers can reach the memorial from Tucson by taking Interstate Highway 10 southeast to exit 302, then taking Arizona Highway 90 south to Sierra Vista, and then AZ 92 south to Coronado Memorial Drive, which leads to the memorial entrance. An alternate route would be to go west from Bisbee on AZ 92 to Coronado Memorial Drive and follow it to the memorial entrance.

Many visitors are either year- round or seasonal residents of southern Arizona who make day trips from home. The memorial's increasing visitation reflects population growth in the region. Most visitors from outside the area come to the memorial as part of a larger regional travel itinerary.

The memorial's visitor facilities, described below, are the visitor center, a picnic area, the road from the entrance to Montezuma Pass, and a shelter and interpretive waysides at Montezuma Pass. Overnight use is not permitted at the memorial.

- The visitor center, near the center of the national memorial along the main road, offers orientation, information, an

interpretive trail, and restrooms. The parking area holds about 20 cars.

- The picnic area is just south of the main road and across from the visitor center. Facilities include tables, water, and restrooms.
- The road climbs from the entrance to the top of Montezuma Pass. From the pass there is a panoramic view of the San Pedro River Valley, where Coronado may have entered what is now the United States.
- The scenic overlook at Montezuma Pass is 3 miles west of the visitor center. There are interpretive waysides along an interpretive trail 0.4 mile long leading from the pass to Coronado Peak. From Coronado Peak, visitors can view the San Pedro River Valley to the east and San Rafael Valley to the west.

Coronado Cave, 600 feet long, is accessible by a one- way trail 0.75 mile long that begins at the west end of the visitor center parking area. The trail, formed by water seeping through cracks in the limestone, contains numerous formations, some of which are still growing. The cave has numerous scalloped and tilted limestone bedding planes that illustrate the tectonic and hydrologic history of the region. A permit, free of charge, must be obtained at the visitor center before entering the cave.

VISITATION TRENDS

Recreational visits to Coronado National Memorial increased by 87% over the past 20 years, from 47,825 in 1981 to 89,523 in 2000. Visitation increased by 58% between 1990 and 1998, with 1996 the peak year. In the same period, the population in Cochise County grew 27%. The average yearly visitation over the past 10 years was about 85,890. The yearly average rises to 91,750 when the most recent five years are considered. Increased visitation

to the memorial in 1999 can be attributed to an article about Coronado Cave in the January 1999 issues of *Arizona Highways* magazine. Factors that decreased visits since 1981 were a fire in 1988 and U.S. government shutdowns in 1995 and 1996.

Visitation is highest in February, March, and April. Many school groups visit in May. The busiest week usually is the one between Christmas and New Year's Day. Between 1990 and 2000, the lowest visitation month was June three times, September and October twice, and January, February, August, and December, once each.

Figure 4 depicts the annual use of the national memorial based on traffic counts. Memorial visitation generally rose from 1981 to 1996, when visitation reached a high of about 96,000 visitors. After this period, visitation declined slightly, to about 90,000 visitors annually.

Most visitors go to the higher elevation sites in the memorial. The lower grasslands are little used for recreation; however, the use of these lower elevation areas is increasing because of visitor interest in exploring and hiking more of the memorial.

Visitation is expected to continue to increase throughout the 15- to 20- year implementation of this plan. The following factors are expected to contribute to increased visitation:

- increases in local population size
- increasing urbanization
- the development of other local tourist attractions, which will draw additional nonresident visitors into the area

The trend of increasing use and a growing proportion of visitors originating from outside the local area, if it continued without corresponding improvements in visitor services, might eventually affect the visitor experience at Coronado National Memorial.

Coronado Cave is one of the attractions of the memorial. About 5.5% of visitors to Coronado

National Memorial include the cave in their visit. Visitation to the cave more than doubled between 1990 and 2000, with about 5,000 visitors in 2000, compared to an estimated 2,400 visitors in 1990. The dramatic increase in cave visitation in 1999 is attributed to the *Arizona Highways* article on Coronado Cave mentioned above. Figure 5 depicts visitation to Coronado Cave between 1990 and 2000.

Hiking is a popular visitor activity. Some popular trails are described below. The four trails in the memorial are predominantly in the oak- Mexican piñon- juniper woodland association. The trails to the picnic area and to Coronado Cave also traverse a portion of the Arizona sycamore- Arizona walnut- oak riparian association.

- Joe's Canyon trail, 3.1 miles long, starts just west of the visitor center, passes through the saddle at the top of Smuggler's Ridge and joins with the Coronado Peak trail to the Montezuma Pass parking area.
- Yaqui Ridge trail, 1 mile long, descends from Joe's Canyon trail to International Boundary Marker 102 at the southwestern corner of the national memorial. This trail is the southernmost point of the 790- mile Arizona Trail, described below.
- Crest Trail, 2 miles long within the memorial, extends 24 miles from the Montezuma Pass parking area to Fort Huachuca. Also part of the Arizona Trail, the Crest Trail is a popular route to Miller Peak in Coronado National Forest.
- The 790- mile- long Arizona Trail starts in Coronado National Memorial at marker 102 on the Mexican border and runs the entire length of Arizona to the Arizona- Utah state line. Parts of some other trails identified above have been incorporated into the Arizona Trail route.

Some visitors use national memorial facilities, including the road to Montezuma Pass or the Crest Trail, for access into

Coronado National Forest, which is north and west of the memorial.

FIGURE 4: VISITATION TO CORONADO NATIONAL MEMORIAL BASED ON TRAFFIC COUNTS

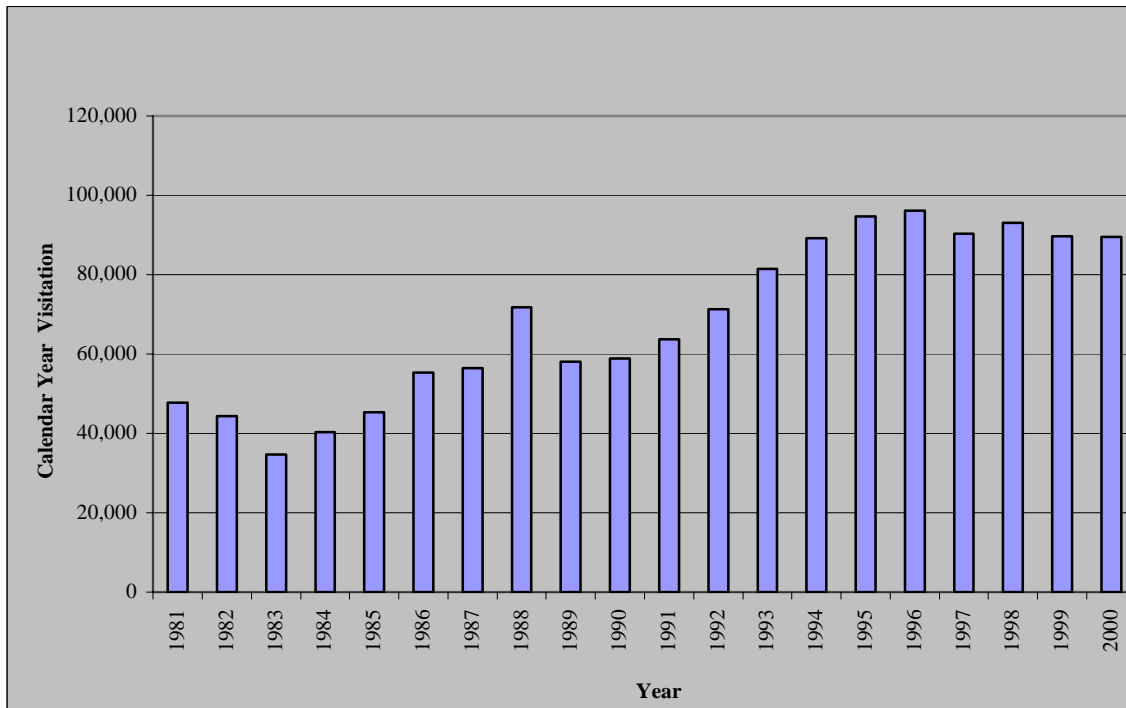
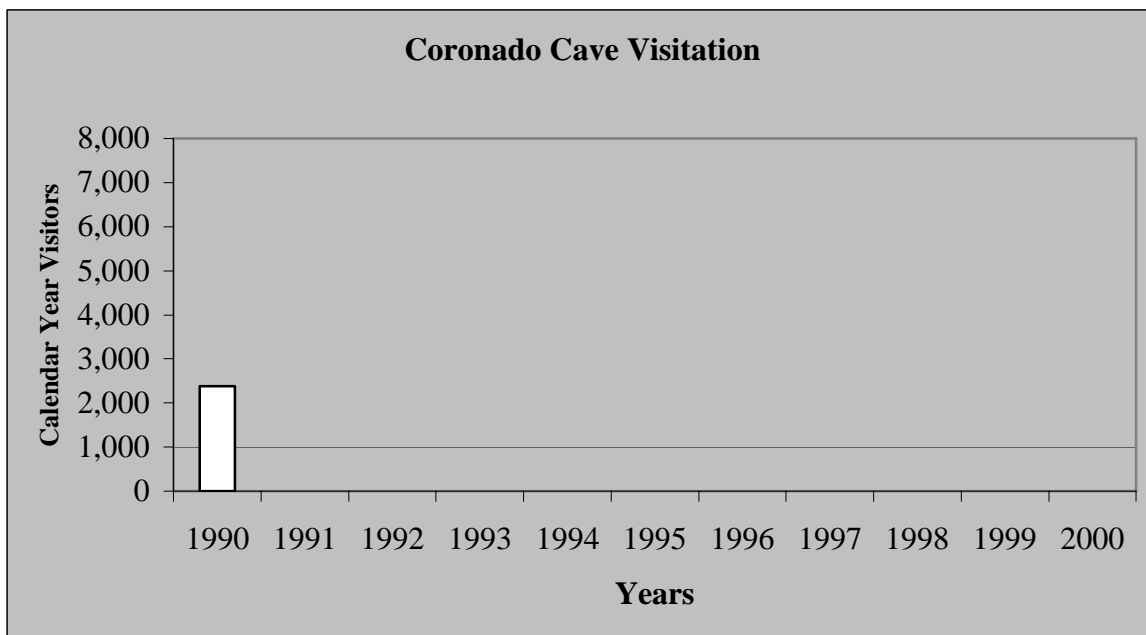


FIGURE 5: VISITATION TO CORONADO CAVE IN CORONADO NATIONAL MEMORIAL



VISITOR SERVICES AND INTERPRETATION

At the visitor center, a staff member at the desk offers orientation, information, and visit planning. Coronado's expedition is described in a video and in exhibits of artifacts and replicas. The bookstore offers materials about the memorial, its natural and cultural resources, and the exploration of North America. Outside, a short interpretive trail identifies some native plants of the area. Wayside exhibits about Coronado's expedition are found at Montezuma Pass and along the Coronado Peak trail. In addition, the staff works extensively on national memorial themes with groups and schools through the outreach program.

VISITOR EXPERIENCE

Visitors to the Coronado National Memorial can enjoy the visitor center, see views from Montezuma Pass and Coronado Peak, and picnic, hike, and observe wildlife. About a third of the visitors come to the visitor center, and about 5.5% visit Coronado Cave.

The visitor center is too small to accommodate the existing level of visitation. Constraints include a lack of appropriate indoor space for hosting large groups that visit the memorial.

The two grazing allotments cover 39% of the national memorial. Interactions between visitors and cattle occur in and around the grazing areas. During scoping for the *Livestock Management Plan* and for this document, a number of complaints were received about the conflict between recreational use and livestock. It is expected that increasing demands for activities such as hiking, birding, and biking will result in more visitors being present in the grazing allotments.

VISITOR SAFETY

The road to Montezuma Pass is paved from Arizona Highway 92 to 1 mile west of the visitor center. From there to the top of the pass, it is a narrow, steep, mountainous dirt and gravel road with tight switchbacks. Some visitors have said they feel uncomfortable driving their vehicles to Montezuma Pass because of the winding, rough road and the steep dropoffs without guardrails. Despite these conditions, accidents are rare on this low-speed road, and the few accidents that have occurred were not serious.

The memorial is in an area frequently used for smuggling undocumented aliens and illegal drugs. This creates a potential danger to visitors; however, they usually are unaware of these activities except for infrequent encounters with undocumented aliens asking for rides. There has been only one serious incident of visitors encountering smugglers: a hiker was assaulted at Montezuma Pass, and her vehicle was stolen.

LOCAL ATTRACTIONS AND OTHER RECREATIONAL OPPORTUNITIES

Several other attractions and recreational opportunities in southern Cochise County attract visitors to the region. Some of them are listed below. People who visit these places often include Coronado National Memorial in their itinerary.

Kartchner Caverns State Park, about 35 miles north of the memorial on Arizona Highway 90, opened to the public in November 1999. The caverns contain about 13,000 feet of passages and two rooms as large as football fields. Tours of the caverns and their multi-colored formations are available to the public.

San Pedro Riparian National Conservation Area is about 10 miles east of the memorial. The conservation area contains about 40 miles of the upper San Pedro River, extending from the United States–Mexico border north almost to St. David. The national conservation area, which was designated by Congress on November 18, 1988, is administered by the Bureau of Land Management, U.S. Department of the Interior. The **San Pedro Trail** parallels the river though most of the national conservation area. Nonmotorized activities are available there, including birding, hiking, bicycling, and horseback riding. When completed, it will be about 30 miles long.

Ramsey Canyon Preserve, owned by The Nature Conservancy, is known for its scenic beauty, diverse plant and animal life, and excellent birding opportunities. It is about 3 miles west of Arizona Highway 92, about midway between the national memorial and Sierra Vista.

Tombstone, about 35 miles northeast of the memorial, is best known for its silver-mining history and the 1881 gunfight at the OK Corral. The shootout, symbolizing the town's reputation for lawlessness, is reenacted daily. The Tombstone Courthouse (1882) has been designated a state historic park, and the Tombstone Historic District is a national historic landmark. Sites in Tombstone listed on the National Register of Historic Places are Saint Paul's Episcopal Church, Tombstone

City Hall, the Tombstone Courthouse, and Tombstone Historic District.

The Arizona Trail, mentioned previously, extends from the Arizona–Utah state line to the United States–Mexico border at Coronado National Memorial. Trail users can hike, ride horseback, cross-country ski, and go mountain biking except in wilderness and specially managed areas. Numerous private, local, state, and federal organizations, including the National Park Service, are working with the Arizona Trail Association to complete the trail.

Fort Huachuca, established in 1877 as a base for American soldiers fighting in the Indian Wars, was home to the Buffalo Soldiers. That African-American cavalry served with General Pershing when he chased Mexico revolutionary leader Pancho Villa in 1916. Areas of the fort outside of the firing ranges and impact areas are typically available for recreational activities, including birding, hiking, horseback riding, golfing, fishing, and hunting.

Coronado National Forest, (mentioned earlier) north and west of the memorial, is a popular location for hiking, camping, hunting, and fishing.

SOCIOECONOMIC ENVIRONMENT

The socioeconomic study area for this plan primarily includes Cochise County, Arizona.

DEMOGRAPHICS AND ECONOMICS

Cochise County, which encompasses 6,215 square miles, is as large as Rhode Island and Connecticut combined. Most information in this section is from the U.S. Bureau of the Census.

The county's history is tied to mining, chiefly in Tombstone and Bisbee, and to agriculture, particularly livestock. Fort Huachuca provides military employment and also is one of the largest civilian employers in southern Arizona. Other major industries in the county are aerospace, information technology, farming and ranching, and tourism. In addition to the military, some major employers are the University of Arizona, Aegis Communications Group, Inc., several engineering firms that serve the military (Science Applications International Corporation and TRW, Inc.), and Wal-Mart. The county also has a large retired population; more than 25% of its citizens are older than 54.

The 2000 census showed a population in Cochise County of 117,755. This represents approximately 3% of the population of Arizona. Approximately 60% of county residents live within seven cities, as listed in table 12.

Arizona's population grew 30% between 1990 and 2000, and the population of Cochise County grew by 20.1%. Growth in the county was not equally distributed by age; the age groups 35-54, 55-64, and 65+ all grew between 35% and 40%. The 5-19 age group increased by 16%, the 5 and under group grew by only 6%, and the 20-34 age group dropped by more than 3%.

**TABLE 12: POPULATION OF COCHISE
COUNTY, ARIZONA, YEAR 2000 CENSUS**

Location	Total Population	% of County Population
Benson	4,711	4.0
Bisbee	6,090	5.2
Douglas	14,312	12.2
Huachuca City	1,751	1.5
Sierra Vista	37,775	32.1
Tombstone	1,504	1.3
Willcox	3,733	3.2
Smaller towns and unincorporated areas	47,879	40.7
Total	117,755	100.0

The total employment in Cochise County from June 2000 through May 2001 was about 38,000 people. Countywide unemployment during this period varied from 4.1% in October 2000 to 5.1% in February 2001. The highest unemployment rates, which were in Douglas, ranged from 8.5% to 10.5%. Sierra Vista and Bisbee, the two cities closest to Coronado National Memorial, consistently had unemployment rates at or below the countywide levels.

From May 2000 through April 2001, sales in Cochise County totaled about \$700 million. Restaurant and bar sales were 12% to 15% of this amount, and the rest was retail sales.

Coronado National Memorial receives law enforcement services from the Cochise County Sheriff's Office and fire protection from the U.S. Forest Service, Palominas Volunteer Fire Department, and Fry Fire Department. The memorial is in the Palominas School District.

Coronado National Memorial Economics

Yearly administrative costs at the national memorial are about \$740,000. The current national memorial staff comprises 12 full-time equivalent positions.

In 1995 the National Park Service prepared a socioeconomic assessment of Coronado National Memorial. The assessment concluded that memorial visitors spend about \$81.50 per person- day. Based on a multiplier of 1.14, visitor spending generated about 47 jobs in Cochise County.

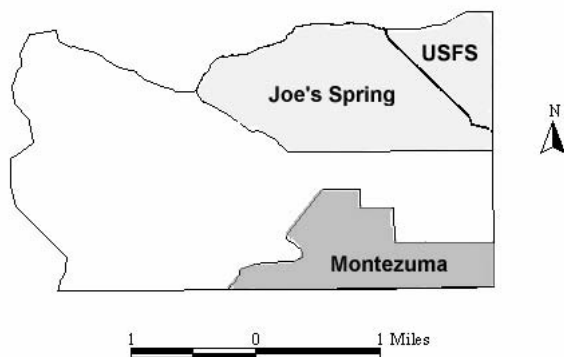
Grazing

The legislation that established Coronado National Memorial said that grazing could continue if it did not interfere with recreational development, as follows:

Grazing of livestock within the memorial area to the extent now permitted within the said area when such grazing will not interfere with recreational development authorized by this act; and . . .

Livestock grazing was eliminated on the former Grubstake and Lone Mountain allotments in the west part of the memorial partly because of conflicts with recreation. The two remaining grazing allotments, Joe's Spring and Montezuma, cover 39% of the memorial.

FIGURE 6: GRAZING ALLOTMENTS



The total area of the Joe's Spring allotment is 1,480 acres. This includes 1,143 acres within the memorial and 337 acres in U.S. Forest Service lands adjacent to the memorial's northeast boundary. The two allotments are shown in figure 6, including the U.S. Forest

Service portion of the Joe's Spring allotment. The memorial boundary is shown in bold.

The Joe's Spring allotment, which has been active since the 1930s, has been used by a single family. Until recently, the annual stocking rate for this allotment was 432 animal unit months (AUMs). The new *Livestock Management Plan* stipulates that the stocking rate in this unit be reduced to 214 animal unit months by 2006 (NPS 2000b).

The Montezuma allotment, which covers 668 acres, has not been stocked since 1990. The new grazing plan would reduce the stocking rate for this unit to 126 AUMs if it was returned to use.

Until 1992, the U.S. Forest Service administered grazing in Coronado National Memorial under a memorandum of understanding with the National Park Service. That agreement expired in 1992, and since then the National Park Service has directly managed cattle use and permits within the national memorial.

Cochise County contains about 330 commercial ranches, with an average cattle herd of 225 to 250 head (Arizona Regional Image Archive 1999a). This computes to a countywide total of 74,250–82,500 head. The same source cites an average carrying capacity for ranches in the county of 8.9 animal units per section (640 acres), which works out to one animal unit per 72 acres.

LAND USE AND TRENDS

About 41% of Cochise County is privately owned (Arizona Regional Image Archive 1999a). This is high compared to a statewide private ownership of 18%. The federal government is the primary landowner in both the county and the state.

The most recent forest plan of Coronado National Forest emphasizes improving recreation opportunities, wildlife habitats, and watershed

conditions as appropriate (Forest Service, USDA 1986a).

Land east of Coronado National Memorial is used primarily for agriculture, with some agricultural land having been converted to residential use. According to the *Southern San Pedro Valley Area Plan* (S. San Pedro Citizen Planning Committee 2001), residential development is mostly made up of large-lot developments of 4 acres or more. More intensive development is occurring in Miracle

Valley, Palominas, and the Rancho Palominas Subdivision.

The 2001 *Southern San Pedro Valley Area Plan* envisions some growth in rural areas, with community character being retained. The plan suggests zoning 200 acres for commercial development, 180 acres of which currently are vacant. The plan contains policies for minimizing light pollution and for keeping important riparian corridors available for groundwater recharge.